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STATE CHARITIES AID ASSOCIATION

HAND-BOOK
FOR
HOSPITAL VISITORS

NEW YORK
G. P. PUTNAM'S SONS
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I

GENERAL SUGGESTIONS.

INFECTION AND INCAPABLE MANAGEMENT OR BAD CONSTRUCTION ARE CONVERTIBLE TERMS, IN HOSPITALS AS WELL AS IN TOWNS, writes Miss Nightingale, and this truth, which is worthy of being printed over every hospital door, may fitly serve as text and introduction for the following pages. The suggestions contained in them are offered for the use of those members of local committees whose duty it is to visit the public hospitals of New York City and State. Women visitors, chiefly, are addressed; for in many domestic details, matters of cleanliness and order, and the tone of the discipline maintained; matters of nursing, diet, and laundry work; the employments and the general condition of the inmates of an institution, women make the best inspectors: In many European cities women are considered among the most efficient public almoners, being not only better able to judge of the requirements of women and children than are men officers, but discovering with greater facility female impostors, the most dangerous and troublesome class with which Poor-law authorities have to deal. In this country there is a growing necessity that women should interest

themselves in some of the problems of pauperism, and that on entering public hospitals and other charitable institutions they should know what they ought to look for, and what they have a right as citizens and tax-payers to demand.

If any argument were needed to justify the wisdom of the State Charities Aid Association in appointing mixed committees, or to prove that the administration of hospitals and consequently their construction—for one point hangs by the other—are matters for housekeepers to consider as well as business men, it would be found in the striking words of Mr. Simon, medical officer of the Privy Council of Great Britain, in his sixth report:—"That which makes the healthiest house makes likewise the healthiest hospital; the same fastidious and universal cleanliness, the same never-ceasing vigilance against the thousand forms in which dirt may disguise itself in air, in soil and water, in walls and floors and ceilings, in dress and bedding and furniture, in pots and pans and pails, in sinks and drains and dust-bins; it is but the same principle of management, but with immeasurably greater vigilance and skill; for the establishment which has to be kept in such exquisite perfection of cleanliness is an establishment which never rests from fouling itself; nor are there any products of its foulness, not even the least odorous of such products, which ought not to be regarded as poisons.

"Above all, this applies to the fouling of *the air* within hospital wards by exhalations from the persons of the sick. In such exhalations are embodied

the most terrible powers of disease, the spreading flames, as it were, of some infections and the explosive fuel of others; and any air in which they are allowed to accumulate soon becomes a very atmosphere of death."

We do not forget that the buildings our committees visit are often old and ill-ventilated, perhaps in some instances full of radical errors of system and plan; but, at the same time, we desire to suggest the more excellent way. The making of improvements may be tedious and difficult, but they will never be made unless knowledge of right principles exists; principles that are of wider application than to hospitals merely, that concern the arrangements of all asylums, poorhouses, almshouses for the aged and incurable, as well as for the sick. We must not dogmatize out of our own inexperience on these subjects; we must not look to politicians and contractors, real estate agents, or even solely to architects; we must look to those who have made sanitary laws their special study for sound advice in regard to the construction of our public institutions and the choice of building sites. Where the hospital is simply an upper room in a poorhouse it is equally important that correct principles in regard to system, ventilation, cleanliness, good order, nursing, diet, etc., should be recognized by visitors, and when necessary pressed by them upon the attention of officials.

It is a reasonable assumption that the purpose of public hospitals is to cure the sick. Yet, trite as the truth sounds, this prime object is constantly

overlooked, and the welfare of patients and public unconsciously sacrificed to mistaken economy on the one hand, or, on the other, to a rage for showy structures. Too often the ambition of an architect or a building committee results in something that is an "ornament to the town" and a "monument of benevolence," but that may prove to be worth little else. The plan made "the prettiest picture," and was chosen accordingly. Too often the choice of a site is determined by political scheming, or a public building is made unsuitably fine in order that money may be spent and somebody get a "good job;" while behind the ambitious front, foul air breeds disease, and scanty, unclean, and unwholesome rations are served to the sick and infirm poor by untrained, insufficient, unhappily, sometimes, vicious attendants.

Visitors must remember that while parsimony in building space, in diet, service, and certain other departments of administration often amounts to inhumanity, merely ornate architecture is no direct help to the inmates and no index of the real sanitary condition of an institution. The "new building" may have its own radical errors, and be no substantial improvement on the shabby old one. Hospital reform can dispense with architectural effects, for it begins with simplicity of construction, and, within proper limits, with cheapness of construction. On the other hand, undue economy is blameworthy; a hospital may be too hastily and cheaply built. Good materials, thorough drainage and plumbing, careful work, cost money. We urge

that nothing be spent for show, but everything for safety and thoroughness.

The Secretary of the Illinois State Board of Charities, Mr. F. H. Wines, gives some excellent advice on this point. "The art of planning [he says] consists in securing the indispensable at all hazards, and as much more as may be possible ; but in wisely selecting, from advantages within reach, those which will most surely and effectually promote the end in view. The first question to be asked is, For how many inmates is this building designed? the second, What is to be done with them within the walls? and every part should be planned with the answer to these two inquiries distinctly in mind. Organize your building. Discriminate the departments. Place those departments nearest to each other whose functions are most closely related. Separate the departments which are not related as widely as is consistent with a wise economy not only of money but of labor and time. Let each department form a whole. Let the division of the outer shell correspond to the division of functions. Do not compel the internal organization of the inmates and of their daily life to conform to the mechanical ideas of the architect and builder ; but compel the architect to shape and divide his entire structure so as most perfectly to correspond to the internal organization. Make the building *fit*, as a glove fits the hand."*

Let visiting committees be sure what it is they want to accomplish when alteration of an old build-

* *Proceedings of the Conference of Charities*, held at Saratoga, September, 1876.

ing or the erection of a new one is contemplated. They will find it much easier to secure public consent to an improvement if they know their own wishes, and can state them with exactness. Let them have their own plan ready, with full details if necessary, and a careful estimate of the probable expense; these can be shown and discussed, and will often carry the point when arguments from hygiene would not be listened to patiently. Committees should be able to demonstrate that, with suitable building plans and an honest use of building funds, at least twice as many patients may be housed and treated, twice as much good may be done for the same outlay, as with an opposite course; and that no community need be deterred by lack of large appropriations from building a hospital for sick and surgical cases wherever one is needed, or be tempted, by the recollection of the sum that had been sunk in it, into continuing to use an old and poisoned building.

Dr. John M. Woodworth, Supervising Surgeon-General of the Marine Hospital service, says, in a report read before the American Public Health Association, in Philadelphia, 1874:

"Tax-payers will not fail to appreciate the argument found in the well-considered statement that a hospital on the pavilion or cottage plan can be entirely built, and the wards destroyed and rebuilt every ten years, for the simple interest on the sum necessary to originally build the old-fashioned, orthodox hospital of like capacity, leaving the item of repairs to such a structure out of consideration."

It is an established fact that massive, many-storied buildings after being occupied as general hospitals for years become soaked with infectious matter, and, under certain circumstances, are dangerous to patients. It is impossible to disinfect them permanently by any known means. The same is true of old frame buildings long used as wards. Those who have studied the subject tell us that no building ought to be used as a hospital longer than ten or twelve years; but that after twenty years it should absolutely be considered as infected and should be torn down. In the case of a substantial building, safety might perhaps be secured by periodically removing the entire inner plastering of the walls and plastering them afresh. But Erichsen thinks that "there is but one remedy possible for a pyæmia-stricken hospital—the pickaxe." A little volume on *Hospitalism*, by Professor John Eric Erichsen, of University College, London, gives facts and recent statistics showing the extent and permanence of wall-poison in old buildings.

By hospital infection or hospitalism, so called, is meant a general morbid condition of the building, or of its atmosphere, showing itself in the recurrence of cases of erysipelas, puerperal fever, pyæmia, gangrene, and the like. These diseases, a case of any one of which will poison the air of the ward for the time and tend to poison the ward permanently, are apt to result from such causes as the following: the long usage of a building; improper classification and aggregation of too great a variety of cases under one roof; dirty walls and old floors; too many beds in

a ward; beds unaired, uncleansed; insufficient bathing of patients and too few changes of linen; imperfect washing of bed and body linen, bandages, and towels; choked air-flues; bad ventilation; bad drainage and sewer gas; wrong position of the water-closets; failure to isolate *nurses* as well as patients during and after infectious cases; lack of thorough personal cleanliness and disinfection among doctors and attendants; carelessness in cleansing instruments; the indiscriminate use of sponges for surgical cases (tow and cotton waste are recommended as substitutes for sponges); dangerous nearness of the post-mortem rooms, and unchecked communication between post-mortem rooms or the out-door sick department and the wards. The death-rate from such local causes, from bad construction and bad management, if honestly recorded, would be the right index of the sanitary condition of a hospital; the character of the cases admitted being always taken into proper account in tables of comparative mortality.

But foul air and other septic influences not only create special diseases and thus kill outright a certain percentage; they lower the vital force of all the inmates of a hospital; they complicate the ailments and retard the cure of a large number of patients. The dead are not the only victims. Dr. Lyon Playfair stated, in the British Social Science Association, estimating for Glasgow, in 1874, that for every death in that community 34 people were ill, each on an average $18\frac{1}{2}$ days, or in other words, that we must count 630 days of disability to one death. The estimate for England is higher; for every one who dies

in England there are two constantly sick, or 730 days of disability to every death. The estimate is based on cases of acute sickness or injury that incapacitate for the time from labor, no account being taken of chronic ailment or infirmity, such as paralysis or blindness. Exact tables of the amount of sickness in the United States are lacking, but it is safe to assume that the ratio here is at least as high as in Great Britain. Dr. A. N. Bell, in a paper published in the Ninth Annual Report of the New York State Board of Charities, 1876, gives the average ratio of sickness to death in healthy American communities, taking all ages, as about 28 to one. But he adds that among the lower classes in city populations, where good health is an exception, the ratio of those actually laid up is considerably larger; the ratio of the sick to the well being often as high as one-third.

No doubt a large portion of this ratio of disability represents time spent by laboring persons temporarily in the sick wards of public institutions. When the bread-winner of a little family dies in a hospital from preventable cause, we lament the increase of the public burden. But the lingering illness of any laboring person in a hospital—or out of it for that matter—is also a public burden; it is a money loss both directly and indirectly; it increases the taxes and lessens, for the time, the number of producers; every case of sickness in a community being equivalent, on an average, to a loss of fifty dollars. Wise economy no less than humanity requires us to adopt the best plans of construction, the best methods of

management, for all our hospitals, poorhouses, and asylums, if we would "avoid adding a complete institution-pathology to that of vice, or misfortune." The right way in every respect, as nearly as we can approach it, is the cheapest way for the well-being of society, and for the interests of tax-payers in the long run.

In an address lately delivered at Baltimore, Professor Huxley very tersely summed up what experience had taught him about hospitals, in these words:—"A hospital may be so arranged as to kill more than it cures; and so administered as to spread the spirit of pauperism among the well-to-do." This last expression will remind visitors that it is one indication of good management, when public institutions are made to the utmost possible extent self-supporting. It is no hardship imposed upon the poor when they are trained to be provident, when for hospital or dispensary treatment those whom thorough inquiry has proved able to pay are required to pay a moderate sum, which otherwise half the time would be wasted on tawdry finery, or other forms of selfish indulgence. A carefully arranged system of medical relief is undoubtedly a check to pauperism. It helps many a poor family to tide over the time of distress which sickness or accident brings. But indiscriminate medical charity may do as much harm as indiscriminate almsgiving of any other sort; and a careful student of the subject, Dr. Gouverneur M. Smith, tells us that dispensary practice, in New York City at least, shows a lamentable increase of late years in the number of patients

of a better class, who are not ashamed to ask and accept freely the services and the resources which should be reserved for the very poor.

If we cannot adopt the broad assertion of some political economists that hospitals foster pauperism, we must admit that our ample charities, both public and private, and their lax administration have done much to encourage improvidence, and to weaken a sense of family obligations. The question begins to press whether social welfare is not likely to be best promoted by reducing our system of poor-houses and hospitals with their attendant evils to a minimum; by individualizing charity, so to speak, making the family—the home—the center or unit of our efforts, through some well-organized plan which shall combine volunteer investigation into the cases of applicants, and personal knowledge of their wants, with official or bureau relief.

The family tie among the poor in New York needs all the help we can give it; anything that weakens it does harm to all. When the head of a household is in hospital, the little family is often scattered, and estrangement begins. John Burns, with a broken leg, surrounded by comforts at an uptown hospital fretted to "get home," and, after many evasions of the reason, at last it came out: "They're very good to me here; I couldn't ask for more; but if I was there I could mind the childer as I lay in bed, and *she* could go out to work and get bread for us all." Or take a wife's story from the same hospital. The necessary preliminary question was asked: "Are you a married woman?" "No, ma'am; not ex-

actly." "Do you mean that you have lost your husband? You are a widow?" "No, ma'am. *I took sick and he left me.*" These are types of many cases. If these could have been equally well nursed at home, the children would not have gone hungry; the wife need not have parted from her husband.

Preventive measures are always wisest. Let the poor be taught and helped to avoid the causes of disease; let there be strict sanitary legislation, and the honest enforcement of laws in regard to tenements, school-rooms, factories, and markets; then, with a good out-door medical relief system, hospitals will be a much less costly item in our appropriation bills.*

But hospitals, to a certain extent, will always be needed, and the main question recurs. The problem is how to cure the patients in the quickest and cheapest way; how to reduce the dangers which inevitably spring from collections of sick and wounded people under one roof. *Disperse the patients*, we say, as widely as may be consistent with economy and convenience of professional care and nursing; classifying them strictly as to disease, age, sex, and condition, *i. e.*, their liability to imbibe infection, or to cause infection in others. To accomplish this dispersion and classification, to solve this problem, where and how should a hospital be built?

* *Relations of Hospitals to Pauperism. Popular Science Monthly*, October, 1876.

II

THE HOSPITAL BUILDING.

As long ago as 1862, Michel Levy, director of the hospital of Val-de-Grâce and consulting member of the Board of Health of France, said, in an address before the French Academy :

“ An ideal hospital would be a small hospital, with small, detached wards, well ventilated, and with beds far apart, remote from centers of population, and surrounded by open walks and grounds. Hospitals that are situated in the outskirts of towns—in the open field, so to say—have always seemed to me more healthy, and have produced more cures than institutions smothered in populous quarters or simply surrounded by an ordinary city atmosphere. Though the air-supply be as generous as possible, and the ventilating apparatus complete, in reality the air of the wards, even at its best, will be just what the air of the street happens to be, no better. Abundant air-supply will not suffice if the air itself is deprived of its life-giving qualities, or is intermixed with poisonous matters. Air is so vitiated when it is scorched by contact with overheated iron surfaces either in the ward or before entering it; when it is borrowed from close corridors, from stair-

cases and lobbies on which water-closets open; or when it is drawn from dirty streets in a packed neighborhood, where perhaps other hospitals, or cemeteries, factories, tenement-houses, and many mephitic centers spread abroad their harmful gaseous or organic emanations."

The latest authorities, eminent physicians and hygienists, and writers on hospital construction, only repeat the same truths. See the list of books and pamphlets given in the appendix.

In order to determine how nearly such an ideal is reached, the first most important point to consider in visiting our public hospitals is their site. This is the point at which sins in hospital building are generally first and irremediably committed. The site should be as open as possible, so as to secure the breeze from every quarter, and somewhat elevated, so that all dampness can drain off. Stagnant water near by, and streams used as sewers, will make the finest building untenable. Do not fail to examine the neighborhood with both eyes and nose, and to study the character of the soil. Remember that if the recovery of the sick is the object of hospitals, they need never be built among dense populations or on bad soil; that if medical schools are an avowed and, to a certain extent, legitimate object, twice the number of cases can be brought under the notice of students in a given time, and thus medical education be still better promoted, in hospitals where a healthy, open site favors rapid recovery. Means of swift transportation are so much improved that, except for accident cases, ab-

solutely no hospital provision need be made within the limits of towns. Our American towns, it is true, grow so fast that they sometimes spread and surround a hospital which may once have been in the outskirts.

Wherever there is an old hospital, cramped and crowded, and money can be had for improvements, let visitors urge that the first improvement consist not in building a "new wing," but in buying adjoining lots, if possible, so as to widen the air-space about the old buildings. For every fifty patients in a hospital there should be nearly one acre of site, so as to allow proper dispersion of wards.

Wherever a new hospital is projected, let visitors use their influence in persuading the town authorities, or the benevolent persons who undertake the work, to put a smaller share of their fund into "monumental" structures and a larger share into land, thus securing the first necessity, an ample building site. If there is not money enough to build as large a hospital as the needs of the town require, let visitors recommend that enough land be provided at the outset, all the same, and held in reserve, and that part of the supposed need of hospital accommodation be first supplied by one or two cottage wards, or a good, small building on open ground; not on any account by a big, many-storied, faulty building smothered in streets.

Before beginning to build a hospital, the proportion of sick poor likely to apply for admission should be carefully estimated, and the number of beds, that is, the size of the hospital, determined. There

are instances of towns where benevolent efforts of this sort have outrun the demand, and hospitals, fully equipped, remain with merely a handful of patients, the running expenses being almost as large as if the beds were all full. For fifty patients there should be accommodation for sixty beds, so that there may always be a few beds in reserve, and that wards may be emptied and cleansed in rotation.

Foliage serves to filter the air of dust ; some trees and shrubs near a hospital are desirable, but they should not be allowed to shade the building at all, or the ground too much. Decaying vegetation and dampness are objectionable ; great care should be taken to keep gardens and ornamental grounds in order ; and instead of fast-growing deciduous trees, "the growth of trees and plants which tend to neutralize malarious matters, especially those containing resinous balsams, should be encouraged."

The plan of light, airy, detached wards such as M. Levy describes, called in Europe barrack wards, or sheds, and with us pavilion wards, that is, one-story buildings raised on low piers or arches, built of brick, or of wood where the fire laws allow it, with hollow, ventilated walls, and to be torn down if, after ten or fifteen years, they prove infected, is the best plan for surgical wards, and one that is growing in favor for all classes of cases. There should be nothing within the four walls except the patients, and their beds, tables, and chairs. The closets and service-rooms, the water and drainage-pipes, and whatever is necessary to make every such ward almost an independent hospital, should be built out-

side in what can be a permanent and even two-story "annex." Ample space should be left between the wards, in order that one may not cast a shadow on the other; connecting corridors, if required at all, should be well aired with side windows, and should never open directly into the wards, but into the service-building; the administration offices and general kitchen for a group of wards should occupy a central position.

The question of detached wards in cold climates is a question of double walls and sufficient air-space between them. This should be ample; there should be a ventilated attic, and the brick arches on which the ward rests should be sashed with glass in winter; double glass sashes may be used for ward windows; then, with adequate heating apparatus, there would be no difficulty. New hospitals, especially those built in connection with medical schools, are apt to receive a large proportion of chronic surgical cases—that is, tedious and offensive cases, requiring dispersion and often isolation. It is the part of wisdom to anticipate this need, and to make provision for such cases by building detached wards.

The attention of visitors is particularly directed to the principles of hospital construction adopted by the State Charities Aid Association, and printed in the appendix. The suggestions given here more in detail are meant to explain and enforce those principles.

In Europe, detached wards, modeled after the United States army hospitals, have been used for civil hospitals, in some instances, for several years,

with happy results; as at Kiel, Berlin, Leipzig, Heidelberg; at Glasgow and at Rotherham, England; also at Manchester, where there is a children's hospital for one hundred and fifty beds, all in one-story wards. Dr. J. S. Billings, as the result of a recent tour of observation on the Continent, writes: "The majority of those who have given most attention to the subject prefer wards of one-story, and isolation and separation of the various buildings."

In America an attempt in this direction has been made at the Roosevelt Hospital, New York, but more completely in the plans for the Marine Hospital, San Francisco, and in the surgical ward of the Presbyterian Hospital, Philadelphia. The contract for building this brick ward, for twenty-eight beds, was \$13,000, without heating apparatus. There are cottage wards attached to the Massachusetts General Hospital, and a very good one-story ward on the grounds of the City Hospital, Boston; and the trustees of the Johns Hopkins Hospital, Baltimore, have formally decided on the plan of one-story widely-dispersed pavilions. This hospital will have four hundred beds dispersed over a plot of fourteen acres.

"So far as detached buildings have been tried in Illinois," writes Mr. Wines, "they are regarded as an improvement. Separate cottages for groups of inmates have not been tried. But I am satisfied from personal inspection that the buildings for the school for dependent children at Coldwater, Michigan, have cost less on the cottage plan than the same accommodations would have cost under a

single roof, and the organization and discipline are certainly very much better."

The cottage plan, wherever it is possible to adopt it, not for hospitals only, but for our convalescent homes, orphanages, asylums, and infirmaries, would break up the cast iron monotony, the dreary mechanical routine of our public institutions, which is inevitable where there is a large household with a limited number of attendants, and would give them something of the cheerfulness and naturalness of family life. "The true principle in providing for dependent and defective persons is to classify them as closely as possible, and to make each class in any one building small."

Hospital visitors throughout this State ought always to throw the weight of their advice in favor of the most advanced theories. The points in the argument for one-story wards may be summed up thus :

1. Experience and science agree in showing that widely-detached, one-story wards allow the most thorough ventilation, and therefore the smallest chance for the accumulation of infectious particles.
2. They neutralize the evils of massing large numbers of cases, or what amounts to the same thing, varieties of cases under one roof. They make classification of cases easy and natural.
3. They require less vigilance ; dust and foul air find fewer lurking holes and channels ; cleanliness and ease of supervision, as well as fresh air, are more readily secured. Two-story hospitals may be kept healthy for a few years with extreme care and

intelligence. Hospitals of more than two stories ought never to be contemplated.

4. The detached-ward plan, which is hygienically the safest, is also the most economical, apart from the amount of land required. A ward hopelessly poisoned by long occupation, if detached, can be torn down without disturbing the general order; and when additional accommodation is necessary, other wards can easily be added one by one, or a short ward can be extended.

5. An immense advantage of one-story wards which visitors will recognize is the ease with which patients can be taken, bed and all, out of doors in fine weather. Even the very feeble can be wrapped in a blanket and rolled out on the grass by an incline, in a wheeled chair, with no fatigue of "getting ready." In two-story hospitals an uncovered gallery or wide platform for the upper floor, opening directly from the wards in such a way as not to intercept air and light, and used as a sunning-place for patients, is an excellent expedient. Window balconies are not enough; men patients especially need space to move up and down in, and to smoke in if rules permit. It goes a long way toward keeping them good-humored and making them well. A tent set up on the grass where there is room for it is a good device.

6. Wherever the builders have been provident enough to leave spare land, every old hospital should at least put up one detached ward for all surgical cases, and a small cottage or two for isolating bad cases; such isolating huts to be regularly burned

every two or three years. Or, as the custom is at Charity Hospital, Berlin, and at the Cantonal Hospital, Geneva, the detached wards (which in that case might be built without heating apparatus other than a small stove) could be used for all the patients in summer, so as to give opportunity for emptying and airing the winter-used wards of the main building. In the appendix will be found a description of an isolating cottage for three beds ; two patients and a nurse ; lately built on the grounds of the Presbyterian Hospital, 70th Street, New York, according to a plan devised by Dr. W. Gill Wylie, of the State Charities Aid Association ; it furnishes a good model for similar constructions elsewhere. In a large hospital there should be two such huts, to prevent the scandal of the mixing of the sexes, which, gross as it seems, has within the writer's knowledge been authorized by hospital officers either ignorant or indifferent concerning the requirements of decency.

Let visitors urge all the points mentioned above wherever practicable ; let them see also that in old hospitals a separate room here and there is kept in reserve for temporary use for special cases. Where there are enough wards to leave one or more at all times unoccupied, and completely exposed to the air and sun, the great danger of gradual contamination of wards is lessened. The rule given by authorities on the subject is that one-twelfth of all the beds in a hospital should be always empty.

Whatever the general plan of building may be, it is a serious error to build wards opening directly into one another, as at Bellevue and elsewhere, thus

making a common atmosphere and doubling risks. In old buildings of this construction let visitors inquire if it is not possible to close up the connection between rooms, and even to floor over staircases, removing the staircases, water-closets, etc., and rebuilding them in towers, outside the hospital, thus to a degree isolating one floor from another.

The cost of a large hospital on what may be called the cottage plan, in the long run, might be about the same as that of one on the ordinary "big house" plan. Fuel and service might be dearer; the cost of construction would be less; greater ground space would be needed, the greater the better. The allusion here is to out of town hospitals, where land in larger tracts may be had at cheaper rates. But hospital construction and management are not questions of saving money, but of saving life. Says Dr. Stephen Smith: "We are persuaded that the liabilities incurred by increasing the population to surface area are so manifold as to render it very unwise to construct two or more stories of wards for a permanent hospital. Nor do we believe that pavilions of more than one story of wards are more economical in construction and management. The only plausible reason urged in favor of multiple stories of wards is the want of adequate ground space, as in the location of hospitals in the built-up portions of cities. But it is questionable whether even that excuse will much longer avail; all modern scientific inquiries into the conditions under which the sick recover tend to prove that hospital sites should be

selected where there is ample area, and hence in suburban rather than in urban districts."

The late Dr. George Derby, in a valuable paper on Hospitals, published in the report of the Massachusetts State Board of Health for 1874, points out the special advantages which would come from building hospitals whose wards should be completely detached, the one from the other, and of the height of one story and no more: "All systems of supplying the needed amount of fresh air to hospitals of more than one story have failed. From the Lariboisière at Paris to the City Hospital at Boston they are failures one and all. With hospitals of one story better ventilation can be had, both in winter and in summer, by means infinitely more simple and capable of management by persons of ordinary intelligence; greater air-space can be afforded, and the inmates can get the benefit of the outer air and sunshine just as soon as they can walk."

The position of a hospital, which should on no account be built with closed courts or wings, must be such, whether it have one or more stories, that all its wards will run in length from north to south, or nearly so, the sun drying the walls and shining in at the windows on one broad side or the other the whole day; the part of the ward presented to the north, or shadow side, being the narrow end. The ends of the wards should not terminate in lobbies, or be obstructed by service-rooms, water-closets, or staircases, but should open by windows or wide glass doors, with transom sashes above them, to the free air. Currents of air always take the direction

of the longest axis ; the end to end ventilation is worth more than the cross-current, for a larger body of air is moved with the same amount of impetus ; it sweeps a ward clean in a few minutes, through and through, and exposes the patients less to draughts. The " annex " containing the water-closets and other service-rooms should be built at the north end of the ward, but a little at one side, so as not to interrupt the air-currents.

Even the smallest hospital ought to be so planned as to consist of at least two buildings, or three where both sexes are admitted ; the wards being reserved entirely for patients, and one building used exclusively for administrative purposes, officers' rooms, kitchen, laundry, lodging, and store-room. Mixing up together in the same building sick-wards and officers' quarters is one of the most common mistakes, Miss Nightingale says, " exposing both patients and officers to risks, and forming one of the usual causes of fever epidemics among the latter. Simplicity of construction, involving as it should always do a provision of abundant light and ventilation through every part of a sick-ward, can only be secured by separating the two departments. The utmost simplicity of plan is an essential of good hospital construction. Complication of plan interferes with light, ventilation, discipline and facility of supervision. Every hole and corner, every passage, every small room which need not have been there, interferes with these four vital conditions of a good hospital. Every skulking-place which can be spared must be avoided. As an in-

variable hospital rule, publicity may be considered as the best police and the best protection. Besides, every five minutes spent upon cleaning what had better not have been there to be cleaned is something taken from and lost by the sick."

Lifts, and cold and hot water laid on, economize labor, making a difference of certainly one helper to every thirty sick. Extra staircases in a large building are a necessity for escape in case of fire, but, in ordinary use, they are bad for discipline. It would be better to have one common entrance, and only one main staircase, if practicable, which should be fire-proof, and to compel all coming and going to be done by one channel, under constant observation. It may be worth while to note that pharmacies into which attendants are allowed to go and shut the door are also subversive of discipline. A lobby window, or a hinged panel in the pharmacy door should be provided, and every one be required to wait outside for the answer to the errand.

The space given up to ward windows should be one-third of the wall space; this is a cardinal rule for visitors to bear in mind; the windows to be on opposite sides, at least one window between every two beds in medical wards, and one window for each bed in surgical wards. We can warm a room artificially, but it is beyond our power to create an equivalent for sunshine and the vital influences, physical and moral, which it brings into a sick-room. Even in warm climates, in midsummer, it would be better to have windows enough and large enough, and to shield the ward from glare by out-

side blinds, or canvas awnings. Inside slatted blinds are objectionable; they collect dust. The window sills should be within two to three feet of the floor, and the sashes not less than three to four feet wide, except in very cold climates, where they may be narrower. There should be a transom sash over each window, opened by cord and pulley; or the top sash should reach close to the ceiling and should open easily; otherwise all the upper part of the room will be simply a reservoir of overheated and bad air.

An excellent plan, and one that visitors can recommend as easy of adoption in old buildings, is to make the window sashes in three cross-sections or flaps instead of two, hinged, one or all, at their lower edge, opening inwards at any desired angle, and closed by cord and pulley. This plan is used satisfactorily in Middlesex and Guy's Hospitals, London. The window frame in this case is the better for being deep, as it prevents side draughts.

In exposed places where double sashes are in use the lower panes of the outside sash may be made to hang on hinges and open outwards by a metal rod or arm, while the upper panes of the inside sash, also hinged, let down inwards. A steady current of air, slightly warmed by passing between the glasses, is thus secured. If double sashes slide up and down in the ordinary way they are troublesome to manage, and you get an additional and perhaps undesired cold draught from the opening across the middle. Large sashes hung with weights are heavy for a woman nurse to push; ropes knot, rot, and break,

windows are left shut, and ventilation comes to an end. With hinged panes and a cord hanging within easy reach, there is no excuse for negligence. To insure attention, see that the window arrangements, whatever they may be, are not intricate, but simple, manageable, and always in repair. See, also, that the windows are systematically opened, and that some one person has the matter in charge; what is anybody's business is nobody's business, and is never attended to.

The size of a ward, and the number of beds which may properly be put in any given space, are fixed by sanitary necessity; but there is hardly a point in the arrangements of hospitals or of asylums for any purpose, as visitors will note, so much neglected as this. Large wards save extra nurses; one head-nurse can overlook from twenty to thirty patients if they are not too much subdivided. Small wards with only half a dozen beds are objectionable in working a large hospital. They increase labor, and are difficult of supervision. The smaller the ward the larger should be the proportion of cubic space allowed to each bed in it; for small wards, where there are two sizes in use, are apt to be reserved for the worst cases. Besides, a certain amount of space is needed for diffusion of air; a large room is ventilated more easily than a small one, but, as Dr. Carroll tells us, "You cannot ventilate a *crowd*, even in the open air."

Square wards with beds all round are undesirable. With square wards some beds must be in corners, on sides away from windows, and the nurse must

always have her back turned to some of her patients. A nurse needs to take in her ward at a glance, running her eye along the two rows of beds as an officer does along the company line, and seeing at once the urgent necessity of any patient. A space should be left between the head of the bed and the wall wide enough to allow a nurse to pass, and the aisle down the middle of the ward should be from ten to twelve feet wide.

As a rule, each bed in a medical ward should have eight feet of wall space; each bed in a surgical ward, nine or ten feet of wall space. The width of a ward should be from twenty-eight to thirty feet, and the length may be four times the width, but never more than that. Fifteen or sixteen feet would be the proper height of the ceiling to the eaves. Good proportions for a medical ward of twenty beds, not counting service-rooms, would be twenty-eight feet wide, eighty feet long, and sixteen feet high. This gives on an average one hundred and twelve feet of floor-space to each of the twenty beds, and, if the ceiling is flat, about eighteen hundred cubic feet of air-space. With pitched roof and openings at the ridge, the air-space and ventilation are increased to advantage. As one or more nurses must always be on duty, night and day, they must be considered in calculating allowance of air; it is assumed that the beds will not all be full at the same time.

Proportions for surgical wards need to be much ampler. Surgical wards can be made larger by lessening the number of beds. Remove at least eight beds, in a ward of the size described, *i. e.*, re-

move enough beds to increase the air-space for each one left to three thousand cubic feet or more, and the ward may be used for surgical cases. In a small hospital of, say, fifty or sixty beds, sixteen beds in a ward is a good basis of calculation for medical wards, the ward proportions in that case being $28 \times 64 \times 16 = 28,672$ cubic feet, or 1,792 cubic feet to a bed; surgical wards to be built of the same size, but with every alternate bed removed.

The proper width and height of a ward are nearly fixed figures; the length may vary. When a hospital grows and more room becomes necessary, short, detached wards, or small wards where the ends are left free, may be extended a little without any change being made in their width.

Prussian army regulations allow only twelve hundred cubic feet to a bed in medical wards. English rules for garrison hospitals give two thousand feet. The Warren and Jackson cottage wards of the Massachusetts General Hospital give, the one 1,840, the other 3,000 cubic feet. "With severe surgical cases," says Professor Esmarch, of Kiel University, "the larger figure is much the safer rule." Crowding is a relative term. A number of bad cases in a room may over-fill it in a sanitary sense, although half the beds are empty, because the air will be more rapidly fouled. The over-crowding of well people, if long continued, we know will produce some variety of typhus fever, while the over-crowding of wounded people, either accident cases, or cases of operation, or of suppurative disease, will be sure to develop hospital poison, in the form of ery-

sipelas, cellulitis, pyæmia, or gangrene. It is the nature of the cases, and not the number only, which causes contamination of the air and creates danger.

Professor Erichsen, from experience in his own hospital, University College, London, gives seven as the number of patients with open wounds who can be put in one of his wards of fourteen bed size with moderate safety. Among the simple rules in hospital hygiene which he lays down in his Lectures, a few may be selected, for they all concern points which properly come under the observation of a visitor, or a head nurse, and which, if enforced, would go a long way toward keeping the wards healthy.

"1. The isolation of patients suffering from old or foetid ulcerations, more especially those of a cancerous character.

"2. The separation of patients with suppurating wounds from one another by putting in the next bed unwounded patients.

"3. Care not to allow more than one-half of the patients in any given ward to have suppurating wounds, even if these wounds be trivial; nor more, if possible, than one-third if severe.

"4. Instantly to isolate all cases of septic disease.

"5. To compel the nurses to wear dresses that can easily be, and that frequently are, washed.

"6. The frequent purification of the bedding, the blankets more especially, which are often very imperfectly cleaned and purified, and, like all woolen fabrics, harbor infection long and tenaciously.

"7. To close every surgical ward once a year, for

a month, during which time it should be disinfected and whitewashed.

"8. And above all, and under all circumstances, to avoid over-crowding, for however short a time."

A little knowledge of the character of the cases admitted to a hospital, and of the significance of their symptoms—knowledge which may be possessed by any intelligent person, superintendent, visitor, or head nurse, without the least trenching upon professional ground—would help the judicious distribution of patients in certain wards. It is not enough understood, for instance, how sensitive to septic poison are cases of burns, nor what a source of danger they become to others when the suppurating surface is extensive, making isolation for them imperative. Lung diseases make as bad an atmosphere, sometimes, as surgical cases do.

If no regard is paid to the character of cases crowded into a ward, or if five people are to sleep in three beds, as happens in public hospitals in this city and vicinity, it hardly matters what the "regulation" cubic space may be. Wards which to the inexperienced visitor seem fresh and pleasant by day, with the windows open and a summer breeze blowing, if inspected in winter and by night, or worse still, at five o'clock in the morning, might be found very foul.

III

AIR SUPPLY.

THE air-space required for each bed has been stated, viz., from eighteen hundred to three thousand cubic feet ; but what should be the air-supply ? It is not meant that a patient shall have his three thousand feet and no more ; for this amount must be constantly changed, at least as often as once every hour, for the same bulk of entirely unbreathed air from out of doors. Every one connected with hospitals or asylums, visitors and nurses, should bear in mind—and it cannot be too often repeated—that we poison the air by our own exhalations, and that with sick people everything depends on getting them as much as possible out of their own atmosphere. But many people are afraid of clean air and have to be urged to take it as they would medicine. “From the objection many people, especially the poor, have to fresh air, it might be a life destroyer instead of a life preserver. Never fear fresh air ; it will be one of your most faithful allies in the treatment of disease. Provided a patient were kept warm enough, his chances of recovery would be much greater if he were hung outside of his ward instead of being shut up within its walls.” This is

what Dr. Barnes says in his Lectures to the nurses of the Liverpool Workhouse Training-school. Professor Esmarch, who is high authority, writes: "The maxim must hold good for hospitals, that it is better to have air a little too cold than foul air for our surgical cases."

Let the air-supply, however it is provided, be compulsory; not at the fancy of patients or even nurses, unless they are trained ones. There should be fixed rules, and employees should be required to obey them implicitly.

The ventilation of the wards through the night should be carefully considered; for while air not vitalized by sunshine is less desirable, it must not be wholly shut out. "All the air we have to breathe after dark is night air," as Miss Nightingale reminds us. It is a mistaken plan to let a ward get very close and foul, and then trust to spasmodic flushing with volumes of fresh air. The better way is to provide for a small, steady current of air, constantly flowing through the ward at night, and keeping the atmosphere fresh. The wards of a hospital, unlike the rooms of an ordinary house, are occupied continuously, day and night. To the usual excretions from breath and skin are added special impurities. Suppurating wounds throw into the air pus-cells in a state of decay; the urine and faecal discharges, poultices, and the contents of sputa cups, add to this dangerous material. The result is a foul "stirabout," of exceedingly minute solid particles, which, unless special and constant pains be taken to get rid of it, fastens itself upon wood-work, plaster, bed-

ding, clothing, and everything which is in the least absorbent. In course of time, walls, ceilings, floors, and furniture receive so large a percentage of deposits that their emanations are very harmful. These are "the explosive fuel, the spreading flames of disease," which Mr. Simon warns us of. It is no wonder that special diseases haunt the wards of old hospitals.

In unpolluted air we have the true "elixir of life." The hospital which can furnish the most abundant supply of it will always be the one which will best answer its end. To build and to manage a hospital in such a way as to secure enough pure air, winter and summer, is indispensable in hospital reform. Notice that the phrase is pure air; ventilation *plus* cleanliness.

How much is "enough"? The warm air currents of the Warren Ward, Boston, were measured by Dr. Derby on several occasions in the air ducts of the basement and at the outlets in the ward floor. He writes, April, 1874: "The supply of air is enormous and without perceptible draughts. On one occasion I found air entering at the rate of five feet a second, which would give for the four ducts (I measured the velocity in each) 144,000 cubic feet an hour. There being twenty patients, this gives 7,000 cubic feet an hour for each. This is a great supply, but *there cannot be too much*. On the whole it is the best ventilated hospital ward I ever saw." The winter arrangements for this square cottage ward are as follows: In the center of the ward is a chimney stack, on two opposite faces of which are

open fireplaces, and on the other two, open Franklin soap-stone stoves, the flues of which are four iron pipes, placed inside the stack. For auxiliary heating there are four steam radiators hung beneath the floor and supplied with fresh air by four ducts from outside, with hot air registers in the ward floor. Further ventilation upward is provided by foul air registers in the ceiling opening into a large center roof ventilator; and downward by twelve foul air registers in the floor, connected with the chimney stack by foul air ducts running between the floorings.

An undesirable detail of the above plan is the position of the hot air registers. Hot air registers should be put in the walls, never in the floors; it is a temptation to patients to sit or stand over them; dirt collects easily in them, and careless men have even been known to use such floor registers as spittoons. The best place for foul air registers is in the floor, under the beds; they should be wide-mouthed, of larger area than the foul flue, and should be fitted with dust boxes, easily removable for cleansing. No registers used with heating apparatus, or at the mouths of ventilating flues, should be set permanently in the walls. They should be movable, without breaking the plaster, so that the mouths of the flues may be regularly cleansed. Fluff collects and packs in such places, and they become literal hot-beds of disease.

Visitors do not always, of course, have the means of accurately measuring the quantity of air which enters a ward by the registers or air shafts; a math-

ematical formula would be necessary, and an anemometer to determine the exact velocity of the wind. The best that visitors can usually do is to see that abundant and proper means of ventilation are provided, and that these means are really used. Mr. G. E. Waring, writing of house ventilation, quotes Dr. De Chaumont, as saying: "The sectional area of ventilation openings requires to be one-third of a square foot, or forty-eight square inches for each occupant of an air-space. This includes both exit and entrance flues. If there is a fresh air opening one foot square, and if the current can be steadily kept at a velocity of five feet a second, at the point where the air enters the ward—a velocity equal to the motion of the air felt in walking at the rate of three miles an hour in a still atmosphere—there would obviously be a supply of five cubic feet of air per second; or, as there are 3,600 seconds in an hour, $5 \times 3,600 = 18,000$ cubic feet of air per hour;" a fair supply for six persons; but less than half the supply per patient received through the larger ducts of the Warren Ward, which Dr. Derby did not find too much.

Where ventilating flues are used, for fresh or foul air, each floor of a building should have its own flues, with but one register or opening to each flue. With a view to reduce friction the inner surfaces should be smooth-finished, tight at the joints, and there should be few or no bends and angles, round flues being the best. A single fresh air flue will be more effective, Mr. Waring says, than several flues having an equal aggregate area. "The relative ven-

tilating capacity of openings is in proportion to the square roots of their area. One opening of one square foot will deliver twice as much air as will four openings of one-fourth square foot each."*

In regard to foul air exits, care must be taken not to have the shafts too large; otherwise the current will play about in them and not be drawn steadily out, or there will be downward cold draughts. A revolving cap at the point where a flue reaches the outer air, and some method of warming the mouth of the flue in the ward by a gas flame, or lighted lamp, or coil of hot pipes, or by using the heat of some chimney, would be a great help to suction. The hanging lamps in the neat little houses of some of the Shaker communities are fitted with funnels over them, and tin tubes running into the outer air. The lamp smoke is thus got rid of, while the tube acts as an extraction flue for breathed air. Foul air is a very sluggish thing. It is its sluggishness which makes it foul; it is stagnant and as unfit to breathe as stagnant water is unfit to drink. If air is left warm and motionless and dark, it will breed corruption as water breeds it under the same circumstances, only more rapidly than water. Foul air will not always find its own way to a particular hole in a wall and leave of its own accord; it must be compelled to go. There must be forced ventilation, by some device or other, in closed places, and the extraction method is the safest. "Air is like a rope;

* For formulæ for calculating the effective sizes of inlets and outlets see also Dr. Parkes' *Manual of Practical Hygiene*. London, J. & A. Churchill, 1873.

you can pull it better than you can push it," says a mining engineer. But the best plan is not to have any closed places.

City hospitals are sometimes provided with forced ventilation by means of a fan, or by one central aspirating chimney, or both; the fan pumping fresh air in, the aspirating shaft being supposed to draw foul air out; but this is expensive, intricate, and often unreliable machinery; each ward needs a chimney to itself; no one aspirating chimney can do all the work which it will be set to do in a large hospital. Besides, when the wind shifts, or the temperature varies, the air current is sometimes reversed, and the apparatus may be of no avail; while the use of open windows and fires is almost precluded—windows being used for light only, the cracks around them actually stuffed up, and the whole dependence placed on artificial ventilation. City hospitals which desire and can afford to have a ventilating fan should run it by a separate engine, independent of the regular heating apparatus, so that it may work without break, day and night, summer as well as winter. If continuous use is not feasible, the fan should certainly be driven every morning and evening, say from 5 A.M. to 8 A.M., and from 7 P.M. to 10 P.M., for it is at these times that the air of a ward grows most foul and needs to be thoroughly cleaned out.

But ventilating apparatus which may be necessary in crowded cities, for the purpose of drawing the air from a point above the roofs, would be superfluous in an open space where one only needs to throw

open the windows in order to admit free air and sunshine. In some of the points vital to success visitors may feel that their little country hospitals have the best chance. The simplest and surest ventilating fixtures are open windows, open doors, and open fires. Says Miss Nightingale: "If a hospital must be ventilated artificially, it betrays a defect of original construction which no artificial ventilation can compensate; it is an expensive and inefficient means of doing that which can be done cheaply and efficiently by constructing your building so as to admit the open air around."

In the majority of instances opening the ward windows and doors must be the chief dependence for ventilation; window sashes being left two or three inches down at the top on the sheltered side of a ward, except in severe weather, without injury to any one. Dr. Stephen Smith airs his wards at Bellevue by having the doors and windows opened for a few minutes every hour or two, the patients being covered with blankets meanwhile to protect them. In summer weather windows of course should be left wide open constantly. But where there are windows only on one side of a room, the only door being opposite, these may all stand wide open and yet an observant visitor will find the air on each side of the door and in the corners very slowly stirred, if at all. It is still worse where the door is not opposite the windows. All such rooms are unfit for surgical patients; hence the best plan and the only one admissible in new constructions is to have windows on opposite sides of a ward and no blank walls any-

where. Where there are transoms over all the windows, it is a good plan to open every other transom, and raise the opposite corresponding window from below a few inches, placing vertically on the sill a board about twice as wide as the opening, that is, overlapping the sash when the window is up, and an inch or two removed from the window. An interchange of outdoor and indoor air goes on without any direct draught upon the patients.

There are several forms of window ventilators which are simple and effective for winter use. One has two stove-pipe elbows thrust inward through a strip of board, with valves in the mouths of the pipes. Put at either the top or bottom of a sash this fixture admits and drives the fresh air upward to a level from which it falls and mingles gradually with the air of the ward. Close wire netting makes a useful shield at the top of an open window, checking and turning the draught upward, or a sheet of zinc pierced with holes through which the air filters may be substituted. A good device is a thin board or a sheet of zinc or copper, rigged at an angle, with flexible sides of stout cotton or leather, and dropping forward slightly like a wall-pocket, in front of a lowered sash ; or a strip of board or zinc may be put vertically, as already described, on the window sill. Currents of air admitted on a level with the beds, however, are often undesirable ; they drive the odors of one bed across the rest, and are apt to chill the patients. Currents of fresh air admitted near the floor keep the feet cold. Even volumes of warm air sometimes come through wall registers with force enough to

make a patient imagine there is a "draught," and slyly shut the register if it is within reach. Such registers may be fitted with a screen to turn the air upwards. The nearer the center of a ward and the higher up the fresh or warm air can be allowed to enter the more perfect will be the circulation, especially if there are outlets for foul air in or near the floor in which an outward flow is really kept up.

But draughts are not ventilation; cold is not ventilation. To allow open windows in cold weather there must be an overplus of heat. The best winter ventilation follows the best mode of heating, namely, by open fires. Open fireplaces in the center of a ward, like those in the Warren Ward, already described, are a delightful provision. A slide at the back of the hearth, through which ashes fall into a fire-brick ash-pit in the cellar, would obviate some of the objections to open fires.

It is intended, as stated in Dr. Woodworth's report to the Treasury Department, to warm the new Marine Hospital at San Francisco with open fires, on the plan adopted in Herbert Hospital, Woolwich, England. There are two Galton fireplaces, back to back, in the middle of the ward. The chimney is not allowed to obstruct the ward, for it passes downward and under the floor, and, on reaching the outer wall enters and is carried up through the middle of a fresh air flue. The latter has an opening into the ward near the ceiling. By this plan, a volume of outer fresh air is warmed several degrees in its passage to the ward, thus utilizing to some extent the escaping heat of the chimney. Or the process may

be reversed. If it is preferred that the smoke flue shall be carried directly up through the ward, instead of downward through the floor, it may be of pottery, so as to offer less obstruction than an ordinary brick chimney. The fresh air flue may be brought in under the floor, and form an outer casing for the chimney, the fresh air so warmed escaping into the ward by apertures around the top of the pipe or column near the ceiling.*

Stoves of the right sort act in a measure very much as open fires do, sucking the stagnant air out of cracks and corners, creating a current, and thus encouraging the entrance of fresh air. A pan of water should stand on every stove to modify the dryness of the air. Soap-stone is the proper material for stoves, but even an iron stove, when it has an open Franklin grate, may be so arranged as to help ventilation, the smoke-pipe having an inner or outer casing for warming fresh air, or for extracting the foul air of the ward. The latter method is the one adopted in the cottage ward described in the appendix.

One open fireplace in each ward, *with a fire in it* when the weather allows, is all-important both for cheerfulness and ventilation. It has been proved by experiment that a single open fire in certain states of the wind will remove from a room 1,000 cubic feet of air in a minute. An ordinary fire to burn briskly requires 600 cubic feet of air a minute,

* For descriptions of ventilating fireplaces and stoves, see *Sanitary Arrangements for Dwellings*, by William Eassie. London, Smith, Elder & Co., 1874.

and will suck it from wherever it can get it. The waste-pipe of a wash-basin, or other sewer connection, often feeds a room with air in this dangerous, unsuspected way, unless there is a stronger current of clean air from outside provided.

Let visitors see that where there are ward fire-places the chimneys are not stopped up, and the empty spaces behind the blowers used as receptacles of rubbish, or cupboards for old shoes. A hospital visitor in a neighboring State writes: "I have just come from putting my head up the chimneys of our fever ward, where I made the discovery that four nice, open, wide chimneys, giving the best possible chance for ventilation, were neatly and tightly fitted, so as not to attract an eye that was not directed up them, with boards nailed in at the request of the patients, while at the same time four ventilators were tight shut, and also all six of the windows."

In a large building, in such a climate as New York, open fires cannot be exclusively depended on. Some sort of heating apparatus will be needed in winter, and has advantages in the administration of a hospital, being labor-saving, cleanly, and quiet. But too often the air introduced by furnaces into a ward is surface air, drawn through damp and dirty cellars, and then scorched by over-hot iron. Add to these drawbacks the fact that the temptation with ignorant employees is to shut off all ingress for cold air to the furnace, either to increase the warmth, as they suppose, or to save the fuel. Steam coils, or preferably hot water coils, hung beneath the ward floor, with ample supplies of fresh air directly from

outside, taken at a high level, the air warmed as it passes over the coils, and entering the ward by large registers in the side walls, would seem to be the most thorough arrangement.

In large city hospitals, where steam machinery is used for heating, it is expected to do the pumping, and part of the cooking and laundry work as well. Steam-closets for "airing" mattresses and drying damp sheets, are also often attached to the wards—a questionable arrangement. Let visitors see that dirty towels, wet umbrellas, muddy boots, appleskins, dead flowers, old poultices, and oiled rags, are not stuffed out of sight into hot closets with a full head of steam turned on.

Of all methods of heating, the most improper is that by means of direct radiators, or stacks of hot pipe carried into the wards, collecting dust in their coils, and actually cooking this dust, and whatever other solid particles the air of the room contains, for the patients to breathe. Such radiators are only suitable for warming corridors and passages under favorable circumstances, where volumes of fresh air are necessarily constantly admitted.

In pleasant weather with wide-open windows, or in winter with proper heating apparatus, the question of air-supply is not a difficult one. The really trying time for a hospital ward is in the intermediate season; the dull days in early autumn before the fires are started, or in spring when they are "banked," and the mornings and evenings turn chilly, and the nurses and patients shut every crack, and the ward atmosphere stagnates. Then is the time for an arm-

ful of wood, or a hod of coal, and a light, cheering, open fire. But "eternal vigilance" is the price of hospital hygiene. If a superintendent is intelligent enough, and faithfully attentive to little details, the vexed problems of ventilation and heating will be very much simplified. An engineer cannot dictate the ventilation unless he is a very uncommon man ; only an enlightened person who has studied the subject and has sensitive enough perceptions to tell whether the air is clean or dirty can do this. The main object of the ordinary engineer is to save coal and get credit with the managers for economy. What is unduly saved in fuel is spent in flesh and blood.

IV

WATER SUPPLY.

It is one of the radical necessities that a hospital should have an abundant supply of water, free from the slightest taint or suspicion of impurity, and this is a point which visitors must investigate. A good part of sanitary science may be summed up in one word—cleanliness: clean houses, clean air, clean water. In many country towns the running streams are gradually poisoned by the surface drainage; the soil is honeycombed with poorly-constructed cess-pools and wells, alternately; and the use of water into which organic matter has thus been allowed to soak becomes a fertile source of disease, of “mysterious” epidemics; the seemingly clearest, most sparkling water being sometimes the worst poisoned—like sewer gas, which may have no odor, but kills before it is found out.

“Every well is the drain for the moisture of a circumjacent region, which, at its minimum, corresponds to an inverted cone with its apex at the bottom of the well, and with a base on the surface of the ground at least as broad as the well is deep. But most wells drain a much larger region, and if sunk in an impervious, inclined stratum, or on a slope, may

drain localities many rods distant. Whenever dwellings are within one hundred feet of each other, even on a level surface, there is danger that one may pollute the other's well through some privy, sink, cesspool, or stable. One has only to consider the case of a peopled hillside to realize the inevitable pollution of wells from leaking cesspools or drains farther up the slope.

"Now, it is a very moderate statement to say that nine out of ten cesspools the State over do leak, and are constructed expressly to leak, and thus save the labor and nuisance of frequent emptying. The only proper way to make cesspools, where they must exist, is to make them as tight as possible; but practically they never are perfectly tight, the action of frost, the jarring of the earth from various causes, and unfaithful workmanship preventing it. A forcible illustration of the effects of leakage in fouling wells is given in the report of Mr. Child, health officer for some of the districts in Oxfordshire, England. He says that in consequence of the escape of the contents of a barrel of petroleum which had been buried in an orchard, a circuit of wells sixty feet lower and three hundred yards distant became so affected that the occupants of fifteen houses, containing eighty-two inhabitants, were for ten days unable to use the water for drinking or cooking. Had this soakage been sewage instead of petroleum, who can doubt that the result might have been wholesale water-poisoning, and an outbreak of typhoid fever?"

Visitors will do well to read the papers on *Sewage and Water Supply*, by Dr. Winsor and Dr. Charles

Folsom, in the seventh Annual Report of the State Board of Health of Massachusetts, 1876, from which the above extract is taken; also Mr. G. E. Waring's book on *Sanitary Drainage of Houses and Towns*.

Where water is not laid on, village asylums and hospitals must depend on earth-closets or ordinary privies. All the more care should be used by visitors in observing whether the privies are isolated; whether vaults are rightly constructed, ventilated, emptied often enough, and kept disinfected with copperas and dry earth. If they are sufficiently remote from the water sources, and there is absolutely no odor attending them, they may perhaps be considered safe. But under all circumstances it is better to avoid and abolish privies.

Where water is laid on, it is recommended that soil-pipes—which should be of iron, the joints well closed by pouring in hot lead, and driving it home when cold with tamping tools—be carried up full size through the roof and several feet above it, and be left open at the top for the escape of foul gas. Lead soil-pipes are easily eaten in pin-holes, and the foul gases will escape without other leakage to betray them. Cement and putty joints are useless. Drains and all service-pipes should be laid exposed to view, or so boxed as to be readily examined, at intervals of time, throughout their entire length. Unseen leaks from foul drains running under partition walls will soak a wall or fill a partition space with sewage undiscovered.

All drains should be ventilated by an escape-pipe

for foul air carried from the main drain up to a sufficient height above the roof, but away from all windows or fresh-air shafts. Let visitors see that no shaft for the supply of fresh air to furnaces, or to the wards, has its mouth near any drain or sewer opening. Stagnant, neglected, untrapped, unventilated drains are worse than no drains at all. A building where the drains are without traps and escape-pipes itself actually ventilates the street sewer; or, as Mr. Waring expresses it, "A house is often only a vertical portion of the horizontal sewer."

Ward water-closets must be built entirely outside the ward building, and separated from the ward by a lobby with swing-doors and windows. Let no visitor pass without protest any other arrangement. The closets should never be put against an inner partition, but against an outer wall, so that the drains may pass directly out. The water-flow should be free and abundant. Closets where the flow is controlled by a spring on the door are often out of order. Closets where the flow is produced by pressure on the seat are always filthy. Some automatic fixture flushed with water every few minutes is necessary. There must be perfect self-working apparatus, or else perfect vigilance with a simpler plan—either will do—or there will be perpetual bad odors and contamination. It is dangerous to draw on the main water-pipe to flush the pans. Each closet must have its own cut-off or water-tank; otherwise the foul air which collects above the traps, or the contents of the pans may be sucked into the pipe

when the water falls away in it, as often happens from the sudden turning of faucets elsewhere, and the main water supply will be tainted.

All stationary urinals should have glass or porcelain basins, and the slabs under and behind them should always be of glass. Slate slabs are very unsatisfactory. Painted iron baths, sinks, and urinals are objectionable. They require frequent fresh coats of paint, with the consequent inconvenience of turning off the water and disuse for the time. Tinned copper is lighter than zinc for baths and slop-sinks, wears quite as well, and the old copper is always worth something at the end.

Baths, wash-basins, and slop-sinks should be detached from the wards, in the same way as the water-closets, and should be thoroughly trapped. The walls of these service-rooms should all be finished with a hard, non-absorbent surface, and the flooring laid of tiles, cement, or asphalt.

Drip-pipes of lead running round the edges of slop-sinks, perforated with holes at small distances, worked by a separate faucet and left running, are a great advantage. The sides of pans and sinks are thus kept free from incrustations of filth, and the cold drip reverses the air current and helps to keep down sewer gas. The fixture is a cheap one.

Buckets and utensils for night use must have covers. See that these are washed daily, covers and all, in hot water and soda, or rinsed with carbolized water, after using. All water-closets, lavatories, baths, and sinks must be most carefully inspected and examined by visitors.

The London *Lancet* directs attention to the value of chloride of lead as a deodorizer. The manner of its use is to dissolve half a drachm of the nitrate in a pint of boiling water, and pour this solution into a bucket of water in which two drachms of sodic chloride (common salt) have been dissolved. After chemical action has taken place, the clear supernatant liquid is an odorless saturated solution of chloride of lead. If this solution be thrown into a sink or vault from time to time, the disagreeable odors will soon be destroyed. A ship's bilge was completely disinfected in this way by simply dissolving half an ounce of nitrate of lead in boiling water, and pouring it into the bilge-water, which itself supplied the necessary sodic chloride. Cloths wet with this solution, and hung in fever and accident wards of hospitals, are said to keep the atmosphere sweet and healthy.

A tinned copper bath-tub, full sized, on rollers, ought to be on hand in every hospital, with appliances for filling and emptying it, so that if the bathroom is remote a very sick person can have a hot bath near his bedside. Any simple country hospital can provide this convenience, which is not often enough thought of in the largest institutions. The expedient should only be resorted to in extreme cases, as the emanations from warm baths are bad for the rest of the ward.

Let visitors ascertain what the rules of the hospital are about changes of body linen, and the number of baths a week taken by convalescents and nurses, and whether these rules are enforced. The

purity of the air of a ward, and the general cleanliness will be very much promoted where frequent baths are insisted on. Each person should be allowed at least four clean hand-towels a week, and two extra towels for bathing. Inquiry should be made by visitors as to the abundance of the hot water supply, by night as well as day, in all parts of the hospital; it is an important matter.

V

INTERIOR DETAILS.

THE question of what makes the best wall finish is still an open one. Professor Pettenkofer, of Munich, says that much of the necessary ventilation and transpiration goes on through the walls, and that men ought not to live in wall-tight rooms any more than they ought to wear water-proof clothing continually; or, as Dr. John S. Billings, U. S. A., expresses it, "to make a wall impermeable is somewhat like varnishing a man's skin to keep his under-clothing from being soiled." A good, hard-finish surface, which, after the wall has thoroughly settled and dried, can be painted a light, cheerful tint, and is then easily washed down with carbolized water and soap-suds, is so far the most generally approved here and in Europe.

It has been frequently noticed that in new hospitals or in new wards added to old hospitals the results at first are not so good as was expected; cases turn out badly; erysipelas and other septic diseases appear. This state of things is partly accounted for by the fact that generally the new hospital or the new addition has been built under the pressure of necessity for more accommodation, and the wards

are occupied too soon—before the walls are dried. The quantity of moisture held by such a mass of fresh mortar and plaster is very large; and wherever there are warmth and moisture, emanations from the bodies of the sick will be absorbed and become germs of disease. Time is required to evaporate the dampness and make the walls safe. Wet washing of new walls should never be attempted; they should be scraped and dry rubbed.

Bare brick walls, whitewashed, were chosen as healthiest for the great workhouse hospital, Chorlton Union, Manchester, the next in size to Agnes Jones' Hospital at Liverpool, which is the largest in England. Periodical dry scraping and whitewashing of walls and ceilings with lime is as safe and cheap a treatment as any. Visitors may do good service by noting how frequently the whitewashing process is attended to. It should be done certainly twice a year, but the frequency should depend on the character of the cases for which the ward is used. Wards must be emptied in rotation, for a week or more at a time, so that the scraping, which is a dangerous process, may be thoroughly done.

In one of his army reports Dr. Billings describes the plan of lining the inside of a barrack—walls and ceiling—with canvas, thickly coated with white-wash. He thinks that the plan might be resorted to in old hospitals to tide over an emergency until alterations and improvements can be made—whatever germs of disease the old walls and cracks may contain being harmless so long as they are kept dry and covered up.

New floors should be laid with hard, close-grained wood. Narrow strips of the heart of yellow pine, well filled with rosin, make the best floors; the seams being tongued and calked with white lead to insure an impervious surface, and the strips chosen and sawed with reference to the grain so that there may be no chipping. Oak, in our climate, even when kiln-dried, keeps shrinking and leaves bad cracks. Iron floor joists filled between with hollow blocks of concrete have the merit of being fire-proof. Carpenters should never be allowed to leave sawdust, chips, or other substance likely to decay under a floor, or choking flues. Plasterers also need watching.

Old floors can be made very neat and cheerful-looking by two or three coats of red paint, or of gray for the center with broad, red border. The floors can then be rubbed over with damp cloths or sponges to remove the dust—just as hard-wood floors should be—a plan preferable to either sweeping or scrubbing. A daily damp rub and dry rub will effect the purpose of taking away the dust far better than any amount of mopping and slopping with dirty water. Old, unpainted floors must of course be scrubbed with hot water and soda, or carbolic acid; but the reckless use of water, even in that case, should always be avoided; it soaks into cracks, runs through to ceilings below, and leaves dampness; it makes wood floors spongy and porous, helps decay, and creates pockets for dust and disease. Some woman should invent a ward sweeper and scrubber on the plan of the box-sweeper, but not open to its

objections—one that shall eat its own dust and make no noise.

The wood-work of a ward, of which there should be as little as possible, should be severely plain, without moldings or ledges to catch dust. It should be of hard wood, or kept freshly painted to admit of ready washing and drying. Dust in a hospital is *organic filth*, and should be wiped away with damp cloths as the surest way of removing it.

Let visitors lead a crusade against "feather dusts" and "dry flapping."

An iron bedstead, painted a cheerful color, a small table with a drawer in it, and a chair for each patient, are the chief articles of ward furniture. A locked and ventilated closet with compartments, in some outer room, not in the ward itself, for the personal property of patients, is essential; otherwise dirty bundles of clothing, "back-hair," and old shoes will be found under a patient's bed or between the mattresses. It is the common custom in Europe to furnish patients with hospital clothing, undergarments of cotton or flannel, and a gown of some washable stuff, the patient's own clothing being ticketed and laid away for the time. Such a system with us would help discipline and cleanliness, and save the trouble and time required for marking and sorting the wash. The closets where patients' clothing and ward linen are kept should be constantly examined by the visitor, and the manner in which the washing is done carefully noted.

A locked cupboard hanging against the wall, with pigeon-holes numbered to correspond with the beds,

is the best place for keeping ward medicines. The little partitions should be movable for convenience in cleaning, and a slate and pencil should hang by the cupboard for recording the hours of the doses prescribed.

The wooden furniture should be of a washable kind; the chairs, without upholstery of course, of as easy a shape as can be had; the ordinary, small-seated "hospital chair" is cruelly uncomfortable. A few Boston rockers, and canvas, not carpet, camp-chairs, with arms, are a comfort to feeble patients. A few bed-screens are needed, with covers, made of stout glazed cotton or linen stretched and tied with tape strings on iron frames, so as to be easily taken off, washed, and replaced. If iron stands cannot be provided, ordinary folding clothes-horses will do; but they must be painted, or treated with shellac, so that they can be washed all over regularly.

Glass lotion pans and glass urinals are the best. Glass ought to be turned to use for many more purposes in hospitals than is common. Papier-maché basins and pails seem light and neat, but they soon absorb liquid filth, and are undesirable. Slop vessels of tin are extremely objectionable, as they cannot long be kept free from bad odor. Dark-colored quilts and blankets are to be avoided. That they "do not show dirt" is by no means a virtue; it is a serious objection.

"The hygiene of a hospital should commence with the bed." Wire-woven beds offer great advantages, therefore. A pair of blankets is spread upon them under the patient, the blankets going into the wash

regularly, and permanent mattresses, a prolific source of filth and infection, are got rid of. The wire gauze should be slung not less than thirty inches from the floor, in order to place the patient at a proper height for convenience of doctors and nurses, or the bedstead may be raised on blocks. A high bed keeps the patient above the draughts and out of the stratum of foul air, which is apt to be near the floor, if anywhere, and the space under the bed is more readily seen and kept clean. The bedsteads should be made entirely of iron, sides, end-bars and all, no wood being allowed in the structure.

A few ordinary iron bedsteads, and a few hair mattresses might be kept in reserve for special cases where perfect steadiness is necessary. Some of the hair mattresses may be in sections, for if one section or division is spoiled it costs less to renew it. Patients sometimes complain of such section mattresses that they separate and make cracks; the sections should therefore be strongly tacked together. Some cases will hopelessly infect and ruin mattresses, and for such, bed sacks and pillow sacks also if necessary, are recommended filled with fresh oat-straw. Straw makes better beds than hair, physicians urge, for all ordinary hospital use, even when hair can be afforded, for the reason that hair beds are too expensive to be destroyed and are seldom thoroughly cleansed, while straw beds are washed and freshly filled for every fresh patient.

A good supply of draw sheets, rubber sheets, and rubber pillow-cases should be provided. There

should be a water-tank bed in every surgical hospital (a good pattern is in use in the Hartford Hospital, Connecticut, which cost about \$48, including the iron bedstead), and where it can be afforded there should be a hoisting apparatus for lifting patients up from the bed steadily and gently, while the bed under them is changed, or wounds are dressed.

No rule can be given about changes of linen; the supply should be so ample that beds and patients can be kept perfectly clean all the time, without risk of using damp linen. The linen room should be a sunny, well-ventilated room with slatted shelves. French hospitals furnish excellent models in this respect.

A great assistance in a surgical ward, helping to save delays in fetching and carrying, would be a ward dressing-table on gutta-percha rollers. A strong, common, little hard-wood table such as is used for children to play at would answer. It should be three to four feet long, and about two feet wide; should have a rim round the top, and should roll easily. There should be a shallow drawer at one end for surgical scissors and plaster, and a deep drawer at the other end for clean rags, lint, and bandages. The top would be free to hold the basin, alcohol lamp, or hot-water can for heating plaster, and any other needed article. The whole thing should be no higher than the top of the bed, up to which it could be moved with very little exertion; and it would take the place of the floor, two or three chairs, the bed-table, and the empty beds alongside,

all of which are usually brought into requisition for the surgical dressing of one patient.

No eating ought ever to go on in a ward unless food is carried to some really sick person in bed, or to some one whose presence at table would be offensive to others. Offensive or unsightly patients must be provided with meals in the ward, and explanation, if needed, be gently but firmly made to them. Let visitors insist on a separate room for every ward, to be used as a day and dining-room. Meals are sometimes carried to the bedside when a patient is perfectly able to—and might much better for the morale of it—go into an adjoining room. Or, what is worse, a long table is set out in the ward itself, for all, in the midst of the repulsive associations of sick-beds; cabbage and carbolic acid mingling their fumes together. Get the convalescents away from their bedsides at the earliest possible moment; it is often the turning-point in their recovery. Give them a neat table-cloth, always clean (a very little additional expense will prevent the abomination of a coffee-stained, greasy table-cloth), clean plates, bowls, and tumblers; somebody—convalescents in turn if you choose—to say a Christian grace before meals; a little pleasant talk; a glass of garden flowers, or a basket of fruit and green leaves on the table; and you have taken a long step toward curing your patients, body and heart both it may be. Look in unexpectedly at meal-times to see that the dining-room service, the dishes, spoons, knives and forks are clean, and sufficient in number, and that the food is decently served, and of good quality.

The general kitchen of a hospital is best on the ground floor, and the cook should have a proper number of assistants according to the size of the institution. In a large hospital, a small special kitchen for extra diet, with a special attendant, is very desirable; and here, if need be, nurses may be taught simple, sick cookery, which is an important part of a nurse's education. No nurse should ever be allowed in the main kitchen. No cooking should be done in a ward or ward pantry. The large diet-kitchens with ranges, sometimes attached to each ward in city hospitals, are objectionable; they are misused. A large, light pantry with a dresser for the plates, knives, etc., a sink, with hot and cold water, a good-sized table, and a gas-stove, or spirit-lamp, for heating drinks, or boiling an egg, are all that are required. Add a little refrigerator, with a constant supply of ice, for keeping drinks sweet and cool.

A nurse during the hours when she is on duty ought always to command her ward. Her room, therefore, if she has one attached to the ward, should overlook it by a window. But wherever it is possible each nurse should have her own sleeping-room, away from the ward, into which she would go only when off duty—never leaving the ward at other times. Dormitories with partitions running part way up are justly objected to by the better class of employees. Baths and water-closets for the use of the nurses should be arranged separately from those of the ward.

A small examining-room should be provided for each ward, especially for women's wards. A strong,

long table of the right height with a thin mattress or cushion would be needed, and facilities for hand washing; and a bed, perhaps, on which a patient could rest until the effects of anæsthetics pass off. Such a room would serve as the reception-room for new patients on admission to the ward, and for all minor operations where the large operating-room is at a distance, or where there is no medical school and no general amphitheater.

The laundry must be in a detached and ventilated building, never in or, if possible, near a hospital. Cooking has to be done on the premises, and a kitchen must be tolerated, provided it is well ventilated and is not under a ward. Cooking smells are not always unwholesome; laundry vapors are always so. Heat and moisture charged with organic filth pouring up into sick and surgical wards is as uncivilized an exhibition as can well be found. Let no visitor for any little country hospital covet the objectionable steam laundry and steam drying-rooms often found under the ward windows of large institutions. Hand labor, sunshine, and out-door air are the best dependence for disinfecting and drying hospital linen. No other method will so thoroughly remove ordinary organic taints. But the subject of linen rooms and laundries requires fuller treatment than can be given here. If the laundry is badly situated, and nothing better can be done, get it moved to the top story of the administration building, and dry your linen on the roof.

There should be a separate room for disinfecting all surgical bandages, also linen from any infectious

case, apart from the common wash. Infected articles should be baked in a special furnace or oven for the purpose, in dry heat; or, where steam machinery is used, they should be put into a close, covered disinfecting vat through which live steam can be driven. Erysipelas bandages are burned. See that the best possible provision which the hospital resources will allow is made for all these wants; also that a room in some out-building is set apart in which mattresses may be picked over and remade, and straw beds filled.

The iron or copper disinfecting vat may also serve as a soap-boiler, for in an institution where the meat diet is of good quality there will always be waste fat enough to make all the soap required for laundry and cleaning purposes. In a carefully managed hospital of one hundred inmates, known to the writer, the fat saved and rendered served the uses of the kitchen, made oil for the machinery, and all the soap, both hard and soft, required by the household, except soap for surgical use; while the sale of the surplus fat averaged enough to pay for the potash purchased for the manufacture. It may be well to add that the contract for meat for this hospital was made by its supply committee in 1874, with one of the best city dealers, at thirteen cents a pound for beef by the hind quarter, and eleven and a half cents a pound for mutton by the carcass.

Foul linen shoots are non-essential—they are worse. All such shoots and dust shafts are channels for foul air from one floor to another, as well as for flames in case of fire. Where shoots are built they

should be lined, *all the way*, with glazed tiles, or hard-faced brick, and should be carried up through the roof like chimneys, and left open at the top. They should open below in the open air, if possible on the sunny side of the building, and should be so provided with a flap valve or door as to prevent any regurgitation of air. They should be cleansed regularly by driving chlorine disinfectant through them. But sunshine and fresh air are the best every-day disinfectants. Professor Esmarch says that "the plan of driving away one stench by means of another ought to go out of fashion." Examine the shoots often at both ends; smell up and down them; and the same with dust shafts and dumb-waiters. On no account ever tolerate the sending of soiled linen down in a dumb-waiter used for food. The soiled linen should not be kept in the ward, or allowed to accumulate in lobbies, bath-rooms, or closets attached to the ward. It should be sent at once to the laundry, and where there are no shoots, zinc-lined baskets should be provided for this purpose. It would be better to put the soiled clothes into stout bags, and tumble them out of the window into the court-yard, than allow them to lie about the wards.

See that poultices, old plasters, and dressings are never thrown down shoots or into sinks, but put into the ward refuse-can and burned up at once. Galvanized iron is the proper material for refuse-cans. See where these cans stand during the day, and who is responsible for emptying them, and how often they are emptied. Open the dust-bins and refuse-cans frequently and examine them. Constantly

recurring cases of erysipelas and pyæmia in two beds on each side of a particular window of Middlesex Hospital, London, led to a search for the local cause. It was found in a dust-bin in the area below in the direct line of the window. This was cleaned out and left unused, and erysipelas and pyæmia disappeared from those two beds, to reappear after two or three years when the dust-bin, under a new officer, was again in use.

An important point for visitors to notice, which concerns both the administration and the construction of a hospital, is the position and the general arrangements of the post-mortem rooms, and of the rooms devoted to out-patients, where there are any. The ventilation and thorough periodic cleansing of all these rooms are essential.

Professor Erichsen tells us that "the frequent nearness of the dead-house, and the practice of allowing house-surgeons [in some New York hospitals the printed rules *requiring* them] to conduct the autopsies is undoubtedly a frequent and unsuspected cause of the propagation of disease. Yet who can be surprised at wounds becoming infected when they are dressed by the very hands which have recently conducted a post-mortem, or been immersed in the fluids of a body dead, perhaps, of infectious disease? The practice of allowing the same officer to discharge at the same time duties which are so antagonistic in a sanitary point of view as those in the ward, the operating theater and the dead-house is most reprehensible." The utmost care in the change of clothing, in bathing the person,

and washing the hands with carbolized water are hardly sufficient precautions. The hair, beard, and finger-nails often carry contagion. Absolute non-intercourse between the surgical wards and the post-mortem rooms is the only perfectly safe rule, as Maxim IV, in Appendix A, indicates. No covered corridor should connect the dead-house with the main building; at least one hundred feet of open space should intervene, and it should be in a direction away from the wind. Both the post-mortem building and the laundry should have their own special arrangements for ventilation, and each should have its own system of drains, with separate and distinct sewer connections apart from the wards.

In many respects a large hospital can be managed more safely than a small one. Subdivision of duties is a protection. The necessity of requiring one attendant to do a variety of work involves risk. It is unwise and dangerous to call in a nurse, for instance, to assist at or do the after-work of an autopsy.

Instrument boxes, surgical apparatus, splints, etc., should be periodically aired and disinfected, and instruments carefully cleansed after operations. This is usually the province of the medical officers, but the duty is sometimes assigned to an apothecary, or a man nurse. It will be well to ascertain the rule of the hospital in this matter, and who is responsible for enforcing it. Professor Tyndall, in his researches on the decomposition of vapors by light, found great difficulty in securing perfectly clean tubes. In his lecture on *Dust and Disease* he

speaks of surgical risks (quoting Professor Lister), and instances the case of the evacuation of an abscess, saying, "It is difficult to see how the cannula can be cleansed by ordinary methods. The instrument ought in fact to be made as hot as its temper will bear. But this is not done and inflammation in a wound often sets in," as the result of careless and imperfect cleansing.

VI

HOUSEKEEPING.

HOSPITAL visitors cannot too strongly insist that everything in a hospital shall be kept scrupulously clean, and to that end that good discipline shall be maintained. The best methods and the most modern apparatus are described in this hand-book, for the information of visitors; but simpler conditions and the absence of modern apparatus should be no excuse for the neglect of either moral or sanitary precautions. The same necessities exist and the same principles apply whether the hospital is a large group of wards and buildings, or one or two rooms in a county house.

As the easiest way of showing how a hospital and its household should be managed in those domestic matters which visitors have a right to inquire into and criticise, we give, at the risk of repeating some things already said, a code of directions for a hospital matron, directions which have been put to the test of years of actual practice. In proportion as visitors can assure themselves that all the details mentioned in the following pages are faithfully and regularly attended to, they may rest satisfied that the matron is doing her duty, and that their hospi-

tal is well managed, so far as concerns this portion of their "Woman's Kingdom."

A hospital matron is responsible in the sight of God for the moral and physical well-being of all her employees, and of all the sick, so far as any of their interests are under her care. Every hospital has its own code of rules, laid down by its governing authorities, and these of course must be implicitly followed. There are, however, many details which go to make up the sum of comfort or discomfort of the household, and these will be to a great extent within the discretion of the matron.

Where a corps of attendants is expected to follow the directions of two or three different heads of departments it is somewhat as if two or three different families lived in one house, with one set of servants on whom they all called at once. Something of this is inevitable in a hospital; but the friction is greatly lessened by kindly feeling, by friendly consultation among the heads of departments, and by the fixing of regular duties and regular hours for all attendants, and holding them to strict punctuality and obedience to orders.

If A thinks something is B's duty, and B thinks it is A's, neither will do it; not out of ill-will, but from want of precision on the part of the matron in giving her instructions. Or, if there is "a slight coolness" between A and B, as sometimes happens in the best-regulated hospitals, the work may stand still, and the sick—shame that it should be so—will be the ones to suffer.

Many parts of the work in a hospital must be

done, day after day, week after week, with a mechanical reiteration like clock-work. The comfort of a household of helpless persons cannot be secured in any other way. Nothing must be left slipshod, in the "happy-go-lucky" manner of some officers, who leave everything at loose ends and yet expect that everything will "come out right." This sort of lax rule may sometimes earn a cheap popularity with the lower quality of attendants and the weaker sort of officers, but it is a mistake to believe that conscientious and intelligent persons like it. This class prefer order and system, and respect those officers most who steadily and kindly enforce them. They soon learn that their work is made easier in this way.

The matron must of course set the example of punctuality and exactness. "Like mistress, like maid." A household can soon be trained into regularity and precision by the right methods; half of them will fall in out of pride and pleasure in doing their work well, and the other half because of the example, or because they are afraid of losing their places.

If heads of departments require special services of house servants, out of their regular routine, they should not call off the servant, but should request the matron to do so, or do it through her. The matron plans the work and keeps the run of it, and if house officers call servants hither and thither, and give directions over the matron's head, or independent of her, the work is thrown into confusion. House officers of the better sort understand this.

There need be no trouble here, with good will, a disposition to accommodate, and, above all, a desire to serve the interests of the hospital first and always, instead of one's own petty dignity.

The matron should watch carefully the moral atmosphere of her household, as well as the air they breathe, and do all in her power to keep *both* clean and pure. She should be careful how and where the employees are lodged; that the rooms or dormitories are always tidy; are warm enough in cold weather; are well aired (servants' rooms in some of the best establishments are often reservoirs of foul air for the rest of the house); that the dormitories of the men and women attendants are entirely separated, with separate staircases, or approaches, and that there is no coming or going between them. It would be well to require the men, each one in turn, to make all their own beds and sweep out their own quarters; no women except the once-a-week scrubbers going into the men's quarters on pretense of work, and the scrubbers working under careful supervision. This is a very important matter to consider. Women servants should not go into the rooms of the male officers except at fixed, regular hours to do their work, and elderly, respectable persons should be chosen for this business, and should besides be under careful supervision. Women servants should not be allowed to go to the rooms of private men patients. The nurse of the private patient should do all the work of the room, except the weekly or semi-weekly scrubbing, which is always to be done under supervision. Women servants

should not be allowed to receive professional visits from the house staff except in the presence of the matron. If any servant or attendant is ill enough to require medical attendance and nursing, the matron should at once apply to the superintendent for his or her regular admission to a ward as a patient. All this is also applicable to women nurses. House servants should never go to the wards except on necessary business, nor should nurses or patients be allowed out of their wards except for the same reasons. No loitering in halls or on stairways should be tolerated. Having fixed, well-known hours for all necessary business is a great safeguard. Any coming and going at other than the regular times must be satisfactorily explained, or the delinquent warned, or, if necessary, discharged. *No laxity in these matters should be tolerated for a moment.* One bad or sly man or woman poisons the whole atmosphere, and no matter how valuable otherwise, should be speedily got rid of. Drunkenness need scarcely be enumerated among causes for dismissal. Few hospital officers, however slipshod or time-serving, venture to affront the public by retaining drunken attendants about the sick and helpless.

The matron should not fail to look into every attendant's dormitory, under the beds, behind the doors, and into closets, at least once a day, and occasionally at other and unexpected times. She should inspect every day, and also at unexpected times, all the bath-rooms and water-closets used by the attendants, and allow no filth, rubbish, or torn paper to lie about; newspaper does not easily dis-

solve in water, and if large quantities are used it sometimes chokes the pipes. There should be a regular disinfection and cleansing of all servants' water-closets, at least twice a week, on *fixed* days. Things of this sort done "now and then" or "frequently" are never thoroughly done. *Fix the day* and never allow it to pass over. Wherever the wall-surface admits, servants' water-closets should be whitewashed at least once in three months; if you can command the labor, once a month would be better.

Some simple disinfecting fluid should be freely used in all sinks, drains and closets, and for cleaning wherever the wall-surface admits it. A weak alkali, like soap-suds, is not enough for disinfecting purposes. Something more should be in constant use. The apothecary should prepare and keep on hand some such disinfecting agent, and issue it to the matron with the necessary instructions whenever she calls for it. Carbolized water, and, for more important disinfection, the common preparation of black oxide of manganese, common salt, and dilute sulphuric acid, are as good as anything. The apothecary would of course label these, and give directions for use.

The servants' hall or dining-room should be carefully overlooked, and neatness and propriety in table-service, dress, and manners strictly enforced. The table should be made comfortable, and the food, though plain, be as much varied and as good in quality as the hospital resources allow.

The matron should carefully examine the quality

of all raw material of food, and if she finds it inferior, should so report to the superintendent, or to the proper inspectors if they call directly upon her for such information. Bloodless and stringy beef, rank mutton, and stale vegetables are not economical even though they may "go farther" than wholesome food. The purchase of food, and the making of house-diet tables, will probably be in the hands of the superintendent, or steward; but within certain limits a good degree of variety can be had by putting brains into the bill of fare. Meat once a day is enough for ordinary working people; twice a day for those on extra duty as firemen, night-watch, and night-nurses. Farinaceous foods are very nutritious, and should be freely used for that reason over and above the reason that they are cheap. If the superintendent thinks best to allow a glass of milk once a day at the servants' table it would be a good thing, and would perhaps prevent the misappropriation of milk elsewhere.

Servants should have time given them for church-going, rest, and recreation, and that time should not be encroached upon. But they should be required to be on hand at a fixed hour, and never be allowed to remain out late at night. If late or absent some very good reason should be given for it.

The matron should keep written records of the dates of coming and going, and of the wages of all attendants, and some note of their character and capacity, for the future protection of the hospital. She should also keep a record of the address of some friend of each in case of sickness or death.

The responsibility of the matron for the nursing and her control over the nurses varies in different hospitals. Where the organization allows there will be a head nurse in charge of the nursing, and she will be responsible for the discipline of the nurses. But the matron will certainly have under her care the cleaning and keeping clean of the sick-wards and all their belongings—a most important charge. The faithful or unfaithful execution of this charge makes the difference between a healthy and an unhealthy hospital. Let the matron remember that human lives are at stake, and execute her share of the hospital duty as if all these lives depended upon her. That is the spirit in which to care for the sick poor.

It would be well if there were in every hospital some officer who should undertake the whole business of ventilation and scientific disinfection ; but as this is not usual, the matron will probably be responsible for part of these duties.

The first essential in cleaning a hospital ward is to keep it perfectly free from dust. Dust in a ward is not only filth, it is disease. The mode of cleaning must of course vary according to the surface to be cleaned, but the dust must be *taken away*, thoroughly, regularly, frequently ; not stirred up and allowed to settle again somewhere else, but taken away. The floors, walls, windows, door-frames, wainscot, cornices, ledges, moldings, mouths of the air-shafts, the swing sashes over the doors, the cupboards, fire-places, water-closets, bath-rooms, clothes-shafts, dust-shafts ; every square inch of surface everywhere

must be kept free from dust. Have as little old-fashioned sweeping as possible done in the wards. No one who has given much attention to these matters can look on with patience while an attendant flourishes a broom in a ward in the middle of a thick cloud of dust, not one-tenth of which is got rid of, but which flies up and settles again on every ledge and cornice, drifts over the beds and bed-clothes, and what is worst of all, drifts into the lungs and pores and eyes of the unfortunate sick who cannot get out of bed, or out of the ward. In sweeping, a great deal of dust will escape in spite of every care, and drift into fireplaces, register flues, ventilating flues, open places of every kind, corners and cracks of every kind; therefore all such places must be carefully looked after and carefully cleaned out at regular, frequent intervals. In such places as these, left unattended to too long, dust will be found packed and felted in thick rolls like bits of dirty blanket; and such deposits as these are not only disgraceful evidences of carelessness and neglect, but contain germs of hospital disease.

Do as little sweeping as possible, and for that little use soft hair brooms which carry the dust gently before them in long strokes instead of allowing it to rise and diffuse itself through the air. On no account sweep from one end of the ward through to the other, driving all the dust along all the ward. Begin in the middle, and sweep first one way, and then the other, constantly using a dust-pan; but sweep as little as possible in the wards.

Feather dusters should never be used, unless it

may be to bring the dust down from high levels to lower ones, where it can be reached and carried away with damp cloths or carriage sponges; *nothing will really remove dust but damp cloths or sponges.* Use as little water as possible, and always use a little carbolic acid in the cleaning water; cleaners, unless watched, never change the water in their buckets often enough, but go on dabbing the floor with the dirty fluid. This, and their propensity always to use too much water on the floors should be carefully looked after. The ward floors in some modern hospitals are laid with glazed tiles; very little sweeping will be needed on such floors, but more dusting. In Cuba the floors are of marble, cement, brick, or tile, and are washed every morning with a carriage sponge wrung out nearly dry. With such floors care must be taken not to crack or chip the tiles. Cracks and chips make pockets for dust and filth. A long wooden handle with a large sponge, not a mop, which could be taken off the handle and constantly wrung out in carbolized water and fastened on again, would be a good device for cleaning tile floors. Some clever carpenter could easily arrange such a thing.

The whole surface of floors, and surbases of all the wards should be gone over at least twice a week. If you can command the labor go over the whole surface of the surgical wards every morning before "doctor's call." Windows in wards, especially all surgical wards, should be washed once a week, including of course all transoms and swing sashes over doors.

All hard wood-work is kept in the best condition by an occasional good rubbing with a little boiled linseed oil. This gives it a handsome appearance while it helps to fill the grain and render the wood non-absorbent.

To sum it up, do as little sweeping as possible ; do as much dusting as possible ; and remember that dusting means *taking away the dust*, and that to take away the dust nothing is efficacious but damp cloths or damp sponges.

The beds are the most important articles of furniture in the wards, and should be looked after with great care for dust, vermin, and filth. The condition of the wards, as to clean and sweet air, depends very greatly on the condition of the beds.

The matron should keep herself informed, by consultation with the head nurse, of every case of erysipelas, pyæmia, cancer, typhoid, or of discharging wounds, or of any other case in which the bed is fouled or contaminated. All such beds should be taken out of the ward as soon as the patient leaves or dies ; and the straw, if the beds are straw sacks, should be sent off the premises and burned, and the ticks disinfected, washed, and refilled.

Permanent hair beds are thought very objectionable by physicians. Hair is expensive, is troublesome to pick and cleanse, and unless a hospital is very carefully and intelligently managed such mattresses are not made over as often as they should be, and infection is the frequent result. This is a strong argument for the use of wire-woven beds—they abolish mattresses. If hair beds are in use

all those which have been used for the above specified classes of cases must be promptly taken out of the ward, ripped, steamed with live steam, thoroughly disinfected, and made over in some room provided for this purpose outside of the hospital itself; but even this cannot be considered a perfect preventive of infection. No hair mattress should be used more than six months without being ripped, steamed with live steam, or otherwise disinfected, and made over, no matter what the case. No straw bed should be used more than three months without being washed and refilled with clean straw, no matter what the case.

The blankets from infected beds should be not only washed but disinfected before being used again.

It is even more important to steam and remake the pillows, both hair and feather, from the cases above mentioned. All pillows should also have periodic airing and cleansing, no matter what the case. Empty the feathers from the pillows to be cleansed into a larger bag; sew up the bag and steam the bag, feathers and all. Meantime wash thoroughly and disinfect the empty pillow-ticks and then refill them. Straw pillows as well as straw beds are best for some cases. In all these matters the matron must confer with the head nurse, and issue for use such bedding as the sanitary requirements of the special case may dictate.

If there is no metal vat, or fixture, belonging to the hospital in which hair or feathers can be steamed the matron should ask for one at once. It is easily arranged on the grounds of any building heated by

steam and is indispensable. It must have a tight cover and direct communication with some large chimney. There must also be a large, tight-covered disinfecting tank in the laundry for filthy garments and bandages. But erysipelas bandages should be at once put into the fire and burned. No washing or disinfecting makes it safe to use them again. If there is a steam engine in the hospital its boiler fire may be used for burning erysipelas bandages and the contents of refuse-cans; or with care to avoid the escape of fumes into air chambers, they may be burned in a steam furnace. But where there is only a hot air furnace, or the galvanized iron cylinder stove in the cellar or basement, which is the common heating apparatus in small, ordinary institutions, such a process of burning would be a sure way of returning infected air to the wards, and it must never be attempted. *In such case, all infected articles should be burned at a safe distance in the open air, or in a brick oven constructed for the purpose outside.*

Sheets and pillow-cases should be changed throughout at least twice a week; sometimes much oftener. They should be changed often enough to keep the beds, with ordinary precautions, always clean. There should be no skimping here. If laundry work must be economized let it be economized out of something else; say shirt-bosoms and frilled petticoats for the household, and not out of the bedding for the sick. One musty, unchanged and unaired bed will make a whole ward smell stuffy; how much more twelve, or twenty such beds?

The beds and bedding, the blankets, mattresses, pillows, every article of bed furniture of all the sick and convalescents should be constantly aired, by putting them out of doors in the open air wherever it can be done. Putting them in the steam closets is a poor alternative, but better than nothing. Sunshine is a capital disinfectant for bedding. "Blankets are the very things to catch organic particles and retain them until decomposition takes place, and thus poison the wounds of surgical cases."

The cloth clothing of patients should be thoroughly cleaned by brushing and steaming before being rolled up and stowed away in clothes cupboards or pigeon holes. For the want of such care vermin are introduced into hospitals. This cleaning is part of the matron's duty, as the nurses could only take time to put up the packages of clothing and send them to the steaming-room.

Ward bed-side tables should be kept clean ; no dirt or rubbish allowed to accumulate in the drawers. Never allow newspapers to be used as table-covers ; nothing is more slovenly. See that the tops of all the tables are washed off at least twice a week. If covers are necessary, spread clean towels on them, *never newspapers*. Glass slabs for tables are an excellent invention.

Cupboards of any sort inside the wards are objectionable, and should be very carefully looked after, or they will become nests of slovenliness. No brooms, buckets, mops, damp dusters or anything of this sort should be allowed in them on any account ; no dirty towels, no shoes, or clothing ; no-

thing but clean, new, dry articles, such as new band-ages, lint-boxes, or medicines, if the surgeons choose.

The matron should inspect all ward water-closets, at least once a day. All ward water-closets should be washed out at least once a day. If you can command the labor, wash them out twice a day, morning and evening. Disinfectants should be poured down all ward water-closets and slop-sinks once every day. Never allow litter and paper to lie about in the water-closets. Have a hanging box, or basket (not one set on the floor) in every closet. Furnish cut brown paper. Don't allow newspaper if you can help it. It is less soluble than brown paper, chokes the pipes, and is very slovenly.

Besides soap for ordinary use, carbolic soap should be freely issued for nurses and patients.

Foul linen shafts are an unpleasant device for returning unclean air and bad smells into the wards. A much better device would be zinc-lined, covered baskets, three or four to a ward, to be carried out to the laundry at once. If shafts must be used, keep a constant and sharp eye over them to see :

1. That heaps of soiled clothes are not left in them too long.

2. That soiled clothes are not pitched down loose, catching on the sills and roughnesses here and there, and hanging until accidentally discovered and poked down, spreading foulness all about them. Require that they should be made into snug bundles.

3. That clothes with the "poison" label are not thrown down the shafts at all, but taken direct to the laundry. (The matron should furnish the head-

nurses with "poison" labels, or something like them, and require that these should be securely fastened on all bundles needing disinfection. This she must insist on for the protection of her laundry women, as well as others.)

4. That the shaft doors are kept shut and locked, and the key in charge of some responsible ward attendant. This prevents various tricks and abuses.

5. That the shafts are washed out at the mouths twice a week with carbolized water; disinfected once a month with chlorine gas, and whitewashed once in three months if the surface allows it. The chlorine disinfectant mentioned above (page 73) is as good and cheap as any, but to be effective it must always be used in large volumes.

Dust-shafts need nearly as much care as clothes-shafts. They must be emptied and swept out at least once a day; twice a day if you can command the labor; and frequently whitewashed if the surface allows:

Steam closets, if there are any, must be carefully looked after; for if the racks are stationary (they ought to be movable), dust and fluff, *i. e.*, filth and disease-germs, will drift into and pack in them in large quantities. The smell of frying dust can be detected in these closets whenever they are in ignorant and slovenly hands.

There should be two refuse-cans for every surgical ward, and the matron should inspect these with the greatest care, never less than once a day, and at other unexpected times. Refuse-cans should never be allowed to stand inside the ward, or in any lift

or dumb-waiter. A little zinc-lined cupboard in the bath-room, for them and for nothing else, would be a good thing ; or better still, a neat bracket-shelf outside the window of the bath-room, or of some hall or closet, on which they could stand in the open air. But they should never stand long anywhere. Their contents are always burned. They should be rinsed with carbolized water, both can and cover, after every using ; and if they get a bad smell in spite of all care, should be put aside at once and new ones provided. They are an unpleasant necessity, and should be made as little offensive and dangerous as possible. The covers should be tightly fitting, and they should never be allowed, under any circumstances, to stand with anything in them uncovered. There should be two cans to a ward, so that there may be a place for foul dressings at hand at all times, and the can not in use should be airing or sunning outside. Every private patient's room should have a refuse-can of its own.

Dumb-waiter shafts, whether for the service or for the food, should be looked after, shelves scoured, shafts whitewashed, and occasionally a volume of chlorine gas thrown up through them. No article whatever except food should be allowed in the food lift.

In proportion as all these details are attended to, and attended to with conscientious exactness, faithfulness, and clock-work regularity, the wards will be fresh, sweet, and healthy, or the reverse.

The degree of control of the matron over the nurses varies as we have said in different hospitals,

but the care and police of all the nurses' quarters and dormitories will certainly be within her responsibility. She will also be required to see that their table is comfortable.

She should carefully inspect sleeping-quarters of all nurses, especially men orderlies, at least once a day, and at other unexpected times, and should exercise a careful supervision over the nurses' bathrooms and water-closets, thoroughly cleansing and disinfecting them at fixed, frequent intervals. If she finds a nurse's room out of order in any way, she should, after one warning, make a formal complaint to the head of the nursing department or to the superintendent. If nurses are allowed bed-side carpets, or rugs in their rooms, they should be shaken out every day, and put out in the air, and beaten every week. The same rule is applicable to bed-side carpets or rugs, if allowed in the wards. No worsted screen-covers, carpets, bed-curtains, or upholstered articles of any kind are allowed in the most modern hospital wards. If there are such, they must be carefully shaken and dusted every day, and the curtains changed and washed frequently.

The outside of the building and the court-yards will probably not be within the matron's care. If they should be, she must see that every part is carefully policed every day, and, if possible, have the great hose used for the windows and outside surfaces of the whole building not less than once a fortnight in good weather.

Every ward in the hospital in turn should be, at least once a year, cleared, emptied of all furniture,

closed, fumigated, and then thoroughly cleaned and scoured with carbolized water. This can only be done of course by the order of the superintendent, and at such a time as is convenient to the medical officers; but the matron should seize her opportunity of suggesting it, and it will be her duty to see that it is thoroughly done. Empty the ward. Turn out everything movable. If there are inside shutters take them off the hinges and carry them out. Inside shutters are capital things for collecting dirt. Where they are not properly cared for, a thick paste of dust and organic filth can be scraped from the slats at any time. Hospital windows are much better without them. Stuff or paste up the cracks in doors and window sashes. Shut all the registers, cleaning them out first. If the hospital has steam heat, have the room filled with steam; this will greatly aid the process. A very little trouble will make a temporary connection with the nearest wall-coils for this purpose. Lock the doors to keep out meddlers. Then set free chlorine gas in the steam (see Appendix D); the steam will help to carry the purifying agent into every crack and corner. If there is no steam, water may be sprinkled on the floors to cause dampness. See that vessels of the disinfectant are set on mantel-shelves, step-ladders, or some high point, as well as on the floor. Keep the doors locked and leave the room standing for twenty-four hours. Then, still keeping the doors locked, open all the windows wide to get rid of the stale fumes, and leave the room for twenty-four hours more. Now is the time for stopping cracks in the plaster, wood-

work, and cement, if there are any ; after the fumigation, not before. If you stop the cracks before you fumigate you shut in what germs of disease there may be instead of driving them out and killing them. Then scour thoroughly, everywhere, with soap-suds and carbolized water ; or else whitewash, *ceiling*, as well as floor and walls. Kalsomining the ceiling is objectionable, because such a surface cannot be washed, and cleansing the ceiling is a most important point. If the iron bedsteads can be spared let them stand, of course without any beds or bedding, in the room during the fumigating process. In any case, scour them all thoroughly with soap-suds and carbolized water. Wash down also every other piece of furniture that will bear it, and set all back in their places. See that the ward is dry and that the ward thermometer marks not less than 68° or 70°, and the ward will be ready for re-occupation. This process will take about a week for each ward. In the case of a compactly built hospital of several stories it is very desirable that the *surgical* wards should be put through this process once in six months. Every ward should go through it once a year.

The subject of cooking for the sick and special kitchen arrangements must be left for another occasion. See that the cooking utensils and apparatus are always scrupulously clean ; this has a great deal to do with the flavor and wholesomeness of food.

See that the material is all good of its kind. Report it at once if it is not. It would be preferable

to have only one quality of provisions, such as butter and tea; if there are two qualities the best should be given to the sick, and the second best to the well members of the household.

All meals should be exactly punctual. Ward diets should be served neatly and attractively. Great pains should be taken to see that the food reaches the wards hot and palatable.

One of the first cares of the matron should be to make an exact inventory of all furniture, kitchen and ward utensils, linen, and other property in her charge; and these inventories should be compared with the articles at least once a month, and deficiencies noted.

In the care and issuing of the provisions, and stores of all kinds, the matron should exercise great vigilance and strict economy. Nothing is too small for attention. It is the little items, the half pints and the ounces, that make the difference in the long run. The matron should always keep in mind that it is other people's money she is spending, and should hold herself to a strict account of it, so that nothing may be misused or wasted, but every penny made to yield its full value, and do its utmost good. Every penny of the hospital funds spent upon her friends and visitors, or upon herself beyond her necessary comforts, is wrongly spent.

A matron who respects herself and her work will be loyal to the institution she serves, and to her superiors in office; she will neither do, nor say, nor allow others to do or say in her presence, anything that would injure or destroy the influence of other

officers. She will not indulge in gossip nor countenance it in others; if any one comes to her with idle or malicious tattle she will at once show them that they have mistaken her character and her tastes. This zeal in tattling is no mark of loyalty to the interests of the hospital, for the persons who are so eager to carry about twaddle concerning what Brown said that Jones said that Robinson said, are the very persons who are capable of covering up a real wrong or scandal if it happens to be for their own interest to do so. A hospital officer who is a gossip, full of trivial talk about affairs concerning which he or she should be scrupulously reticent is a melancholy spectacle. No such person is fit to be intrusted with the grave cares of a household of helpless and suffering people.

A wise matron will never make the mistake of intimacies or familiarities with patients or attendants, or the still greater mistake of showing favoritism to any one, or bribing any one—for it is essentially bribery—with special diet or special indulgences which are not equally shared by the rest. She will deal out even-handed justice and kindness to all, making no distinction in the public wards, except that of the greater necessity of the sick person. A matron who allows herself to make use of petty, selfish indulgences in order to persuade attendants to do their duty, sets the example, though she may not be conscious of what she is doing, of corruption in every branch of her household, an example of which attendants are sometimes only too ready to take advantage. There is no greater

disgrace to a hospital than is suggested in the complaint: "I could not get waited on; but So-and-so, who had influential friends, or a little money, had everything he wanted."

There are hospital matrons who are capable of setting aside for their own use some portion of the comforts and luxuries sent in for the sick. It is to be hoped the class is small; a woman who shows such a spirit as this is unworthy of confidence in all other respects.

VII

THE NURSING SERVICE.

HOSPITAL management, besides the housekeeping duties proper—that is, the kitchen and laundry work, the cleaning, the care of all the property and supplies, and the discipline of the household—includes another most important department, namely, the nursing service. The following pages give a few hints on the duties of nurses, and the routine of ward work.

To insure proper distribution of labor and the best care of the sick in a hospital or infirmary there should always be one responsible woman as head nurse for the whole establishment, whether there is a training-school or not, and all the nurses, both men and women, should be under her orders. Her duties are distinct from those of the matron or housekeeper, and are concerned only with the sick. A matron of the right sort will understand that the object of the hospital is the care and comfort of the sick, and that the entire household must be held tributary to this. In very small hospitals the two offices may be combined in one person; but in most hospitals the two classes of duties, nursing and housekeeping, furnish enough work for and require

the undivided attention of two separate persons. It would be quite as detrimental to good order and efficient service to leave the nurses without a head as to leave a household of servants without a matron or housekeeper. Careful defining of responsibility and gradation in authority are essential; both head nurse and housekeeper would therefore report to, and take their instructions from, whoever is their immediate superior—where there is a training-school, from the lady superintendent, so called.

Whatever is the organization it will be found impossible to conduct hospital work in a peaceable and proper manner unless there is perfect accord between the head of the housekeeping and the head of the nursing department, and one sole purpose in all they do, namely, the order and general well-being of the whole establishment. Women who encourage petty differences, or who cannot set aside their own small personal jealousies for the sake of the business in hand, justify all the disparaging comments in which male boards of administration sometimes indulge.

Only trained and competent women should be chosen to fill the responsible positions of heads of departments; and hospital authorities will find it in the end the best plan for securing good management as well as the best economy to select such women, and to make their salaries and their surroundings inducements to them to value their places.

The nursing head may be called either superintendent, matron, or head nurse of the hospital. For convenience she will be called in the following sug-

gestions head nurse ; while the head nurse of each ward who, under the head nurse of the hospital, is responsible within her ward for strict fulfillment of doctor's orders, and for obedience to hospital rules, will be spoken of as "first nurse" of the ward ; her assistants being "second nurse" and "third nurse" respectively.

It should be the duty of the head nurse to know the general condition of every patient under her care, and to inform herself particularly of the nature and probable result of the more serious cases. She should know just what material she has to work with ; the number of assistant nurses allowed by the regulations ; the kind of work she may require of convalescents, and who these are ; convalescent free patients as a rule being required to assist in the light work of the ward. The question of a patient's ability or non-ability to work is strictly a medical one, and a list of names of convalescents should be obtained from the physician and submitted to him from time to time for such changes as he desires to make, in order that no injustice may be done.

Free patients, or patients on any endowment equivalent to a free bed, able to perform light services, will sometimes shirk ; and, on the other hand, a nurse, sometimes not understanding as she should the condition of a patient, may report him as unwilling to help her, when, with an appearance of health, any stooping position or unusual effort in pushing up a window, for instance, might be hazardous.

Patients who are able to do light services are better and happier when employed than when left

idle, and they often ask for something to do. The occupation is good for them physically and morally, and is frequently prescribed by an intelligent doctor as part of his mode of treatment of certain cases. A list of light occupations like the following would help a nurse in assigning convalescents to duty. They may,

1. Collect the plates, cups, tumblers, and spoons, from the bed-tables after meals; washing in the appointed place such of them as are needed in the ward.

2. Dust the window-sills, tables, and chairs with a damp cloth.

3. Be ready to bring a glass of water when needed, and to help at meal-time in carrying bowls and plates to the patients in bed.

4. Go on errands to the head nurse or the diet-kitchen, and hang out bed-clothing on galleries, piazzas, or elsewhere to air, where these services do not involve too much walking about.

5. Roll bandages; scrape lint; sort clean clothing; help in the linen room when the housekeeper needs assistance in light mending.

6. Watch in the wards while nurses go to their meals, being ready to call them if needed; collect and exchange library books; water and tend the ward plants; and such other little serviceable acts which may not make too great a drain upon the strength.

It should be noted that hospital visitors do not always know what to look for, what to see in a ward; they confuse essentials and non-essentials, and are

sometimes disposed to listen too readily to complaints and to criticise managers and nurses when it is their own inexperience which is chargeable. They should remember that the niceties and the exclusive service of private nursing are out of the question in a public hospital, unless there were at least one nurse to every patient. They have only to call on their own recollection of cases of sickness in private families to understand this. Hospital managers have a delicate and difficult task to accomplish ; they are responsible for the wise use of public funds ; the service is expensive, hospitals are not hotels or boarding-houses ; a few essentials are all that the best public institution hopes or professes to provide, and if essentials are met other things must be yielded. Many of the patients in the best public hospitals are under better physical conditions than ever before in their lives, and this alone sometimes makes them exacting. Besides, sickness as a rule is depressing. It often makes patients irritable and querulous. When the sick begin to get well they look at the world with other eyes and small grievances disappear.

Let the visitor encourage the sick to count their advantages, to compare their own condition with that of other patients who are worse off, and to consider, though they are even feeble and suffering, whether there is not something they can do to help and comfort their comrades in trouble. In the hospital previously mentioned, the first gleam of contentment in the face of a sick woman was kindled by the suggestion that she might teach the little Ger-

man girl in the opposite bed to write upon her slate. From that time, although she was helpless and mortally ill, and died in the hospital, she never ceased her efforts to amuse and teach and lead to better thoughts the poor sick people about her.

Let the visitor put herself in the place of the nurse too, as well as of the patient, and picture what it must be to pass nights and days, not only in the midst of painful scenes but responsible for the ceaseless round of the most wearing of all sorts of work. As a general thing nurses of a good class—we do not refer to pauper helpers—mean well by the sick under their charge, and try, ignorantly though it may be, to do their best for them.

If the few essential comforts cannot easily be procured it is generally owing, not to the ill-will of the nurse, but to attempts at economy, unwise or enforced in the wrong direction, or to incompetent, faulty, or clumsy management, or possible dishonesty in some office or bureau—causes over which nurses have not the slightest control.

It is true that sometimes the only chance of redress a patient may have is in an appeal to a kindly visitor. Poor people in public institutions are very helpless; they become parts of a great machine. While visitors receive complaints with caution, taking carefully into account the character and conduct of the complainant, let them not fail to see for themselves whether there is any real ground for dissatisfaction, weighing the probabilities, not generalizing too hastily, and not expecting too many exceptions to rules in favor of this or

that special protégé of their own. In the best hospitals the rules are usually drawn with much thought and care ; they are intended for the comfort and protection of all the patients ; there must be general rules and they must be made for average conditions. It is the regular hours and duties, the order and quiet, the being taken off his own hands and being told, now, you must do this, now, you must do that—the assuming of the whole responsibility by some one else—which is to many a patient an immense relief, perhaps without his knowing it ; it is a framework that holds up the feeble man and helps him to get well the sooner.

The number of nurses needed for a given number of beds will depend upon the character of the cases. In an ordinary ward of sixteen or twenty beds, mixed convalescents and sick—that is, those who can make their own beds and take their meals in the ward dining-room, and those who must spend the greater part of the time in bed—two or at most three regular day nurses will be sufficient. Including night nurses, there should be in a hospital at least one woman nurse to every six beds. There can however be no rule of the kind which will not have to give way to the exigencies of the case. One typhoid fever patient, for instance, may need the constant attendance of one nurse by day and of another by night. Here, the head nurse's knowledge of the nature of the cases under treatment will help her in dividing fairly the work. This division being made, it is her further duty to see that all her subordinates faithfully and carefully

carry out the orders received from doctors, from herself, and from the board of management as given in the hospital rules. The head nurse is responsible for the fulfillment of these duties by her assistants, and she should have a voice in the selection of the nurses and the right to recommend for dismissal those who seem to her unfit for the position.

The head nurse is the one who should always be on hand at the time of the attending physician's visit to accompany him from bed to bed, or ward to ward. She should at this time call to her and take with her the first nurse of each ward, and see that she takes down in writing all directions for the care of special patients. It greatly helps the prompt and efficient execution of medical orders when the head nurse herself is on hand to hear the orders given at each bedside, knowing precisely what the doctor requires and therefore what she must require from her subordinates.

In all general hospitals there are apt to be patients who, after the first crisis of an illness or operation, are left to the discretion of the house officers, and in the press of more serious cases they sometimes slip into a dangerous obscurity. The head nurse should keep such patients under close observation, and on noticing any change of symptoms which may escape attention otherwise, she should ask for instructions. Unexpected deaths among "convalescents" or "chronics," who have dragged along for months hardly attracting any attention, are not uncommon in hospitals.

Directions for proper diet of patients under treat-

ment will be given by the physician in his daily rounds, a blank diet sheet being filled in by him with the proper articles and their amount, and the hours at which special diet should be given. This sheet is the head nurse's authorization for either drawing on the general kitchen for diet, or for such raw material as she needs in order to have the special diet prepared under her direction as may be the rule. No cooking should be allowed in the ward kitchen or pantry beyond warming drinks or making simple gruels. If assistant nurses are to be taught cooking, it should be taught elsewhere. It would be a good thing if one nurse or attendant could be detailed as the diet nurse in each ward, her business being to distribute the diets, see that those in bed are served in a neat and attractive way, and that their little fancies so far as proper are consulted. She should have nothing to do with the medicines or surgical dressings. She might take charge of the inventories and be the property nurse of her ward, and might perhaps do light sewing or mending.

Having received her instructions and conveyed them to her subordinates, the rest of the day, with the exception of the necessary two hours off duty for meals and recreation, will be given by the head nurse to seeing that her orders are being carried out. She will take care that the ward work is systematized and simplified as much as possible. She will assign convalescents to *fixed duties*. She will see that each first nurse has on hand the supply of basins, urinals, clean towels, soft rags, lint, soap—castile and carbolized—bandages, and disinfectants

needed for each ward. She will daily inspect the ward closet where these things are kept, and give special directions for the proper cleansing and disinfecting of all vessels, which work properly belongs to the ward nurses. She will see that all the ward vessels are kept scrupulously clean. No crockery urinals should if possible be used; glass ones are now made. She will see that the ward attendants are furnished with carbolized water, and with instructions how to rinse all these things; and will examine the ward vessels frequently, holding the glass vessels up to the light to see if they are smeared and cloudy, and looking to see whether the lids of the chamber vessels are covered with poisonous dew on the under surface. All these vessels contaminate the air if they are not carefully looked after.

Nurses are responsible for the emptying and cleansing of all vessels, and they must do the work or see that it is properly done; but in well and liberally managed hospitals a ward maid would be assigned to each ward for women, and one or more orderlies to each ward for men who would be under the direction of the woman nurse, and would relieve the nurses of manual work of this sort, and, what is more important, of the necessity it involves of frequent absence from the ward. For certain ward duties in men's wards men attendants are indispensable, as for lifting helpless patients and giving cold baths in fevers, though the woman nurse in charge must be held responsible, and superintend what is done. A sick person is usually rolled in a sheet for any full bath.

The head nurse will direct as to the proper way of bed-making, and the airing of beds and bedding, making sure that all blankets, mattresses, and pillows are exposed to the sun daily when possible, never less than twice a week, and always after a patient leaves. She will direct about the dressing and undressing of helpless patients, and of disposing promptly of soiled clothing, both outside and undergarments, according to rule ; and she will see that the daily morning dusting with a damp cloth of the tables, window-sills, chairs, etc., is attended to. The general cleaning of the wards belongs to the house-keeper's department and will be done by her women ; but many little matters are under the care of the nurses, and the neglect of them will end in discomfort and danger for the patients. No good nurse will hesitate at doing any little service which may be immediately necessary on the ground that it is the work of some one else.

The head nurse will constantly examine the thermometer to see that the heat does not exceed 68° or 70° during the day, nor fall below 60° at night, following the doctor's directions, and requiring regular reports from the night nurses on this point. There should be a self-registering thermometer in each ward for night use.

She will keep a careful watch over the ventilation of the wards, noticing whether on entering she finds a close, stuffy smell, and if so, at once applying the remedy—letting down the windows two or three inches from the top at intervals, on one or both sides of the ward, but in such a way as not to let the air

blow directly on any patient lying in bed. There are always convalescents up and moving about, and the windows by their beds are the ones to let down. The head nurse will instruct her assistants in all these matters, not allowing them to fall into the vulgar error of confounding temperature and ventilation. It has been said to the writer, "such or such a room cannot be badly ventilated; the thermometer stands only at 68°, and never goes above 70°." But the air in a room where the thermometer stands only at 40° may be foul; cold air is not necessarily fresh air, though it is a common blunder among nurses to suppose so.

A simple test for the purity of the air of the ward is to put a saucer of clear lime-water on the floor near the bed, and allow it to remain all night. In the morning if the air is foul the saucer will be found covered with a thin white skimming or crust of carbonate of lime.

The night nursing is a serious matter and one to be carefully looked to. The head nurse appoints her women for this duty with the same reference to the gravity of the cases as by day. Doctors' orders must be faithfully followed all night, and a night nurse must know her business as thoroughly as a day nurse does. If the head nurse is obliged to choose, let her put the inferior woman on day service and the superior one on night service. A large proportion of the sick will sleep quietly, but all seriously ill people need great care, particularly toward the chilly morning hours when the outside temperature may be suddenly lowered. The night nurse must make

careful report of the night service on being relieved from duty ; a written report for serious cases. Great care should be taken to make the connections perfect between day and night service. A light luncheon should be provided for the night nurse.

The head nurse will despise and discountenance gossip and tattle, and will teach all her nurses to abstain from it, never allowing them to tattle about their patients or to listen to those who do. She will remember and teach her nurses to remember that the necessary confidences of the sick as to their diseases, their personal history, their family life and troubles are part of their misfortune and are to be respected. If they come to her knowledge she will hold them sacred. She will encourage her nurses to avoid disputes and jealousies among themselves ; to settle their little differences frankly before they grow and get the upper hand ; to help each other ; to pull together, not apart. She will not let them count any service for the sick and helpless as "menial" service, if it is only the sweeping of a room, or the cooking of a mess of broth, or the emptying of a refuse-bucket. She will not slight or let them slight anything, despising a poor and cheap quality of work—mere eye-service. In all these respects she will train her nurses by example as well as precept.

Keeping in mind what has been said above, a visitor with good ideas about order and cleanliness and discipline will soon learn to see whether her ward is well or ill managed.

Does she feel a sense of oppression on going from

the fresh air into the ward? is it a little difficult to breathe? is there a close smell, and do patients and nurses look flushed and languid? The ventilation is all wrong here.

Are the bed-quilts all put on at a different angle, some touching the floor at the foot, others leaving the blankets exposed, with a general untidy, irregular look up and down the ward?

At what angle is the table to the bed, and the bed-side carpet to the table?

Are there on the table a roll of sticking-plaster, a bunch of lint, some sort of slop, and a wet circle where the basin was put down when the surgical dressings were done?

Are the clothes of the patient who has been in bed a day or two in a heap on the only chair allowed him, or festooned about his head?

Are the cups and plates of the last meal still on the bed-side tables, long after the hour, and sticky spoons lying without any saucer or mug under them?

Are newspapers used as covers for the bed-side tables, and are glasses of flowers standing, the dark color of the water in them showing that fresh water has not been added?

Are unsightly vessels kept in full view of the ward, on the table, or chair, or under the bed, or complicated with a mug of beef tea, a tumbler of milk-punch, and a sputa cup, all as close together as possible at the bed-head?

Is there a smear of beef tea or gruel on the bed-clothes, and a stain of the same sort at the corners

of that helpless patient's mouth ; and is the one in the next bed engaged in wiping his mouth with the back of his hand ?

Are vessels rinsed in the bath-tub, or dishes or clothes washed there ?—an abominable practice.

Does the nurse stand with her hands on her hips and answer the doctor with hesitation, saying, " Well, I guess " about so and so ; or, " I rather think he slept about " so long ; or, " It was kind of middling " this or that ?

Does she discuss the patient in his hearing with his friends or the other nurses ; or criticise before him the doctor's directions, so destroying confidence in the physician ? Does she permit loud talking and unnecessary passing in and out ? Does she allow strangers to peep behind the screens out of mere curiosity ?—a common practice and one very offensive to most sick persons.

Does the nurse taste that sick man's food before him with his spoon to see whether it is right, or snatch the towel his hands have been wiped on to tuck under his chin when she feeds him, or bring in a clumsy china quart bowl full of milk, setting it down with the remark, " Here's your dinner ? "—the dinner standing untasted because holding such a heavy bowl is out of the question for the patient, and drinking from it lying flat on his back is an equal impossibility. Is the poor fellow in the next bed trying to manage his dinner in the same position, tipping up the flaring bowl, while a little stream of milk from either corner of his mouth runs down his neck ?

Does the nurse speak of him as "the cancer man," or the "one with a head," if he has a scalp wound, or fill herself with pins stuck indiscriminately over her dress-waist, or sit on the edge of his bed and say, "You're nervous, that's what it is," when the patient is restless?

Where is the convalescent who should be on duty while the nurse has gone to her dinner, and who might be fanning that paralyzed man whom the flies are making uncomfortable?

These special evidences of confusion on the part of the ward nurses show that there is no competent oversight of the nursing in this hospital. There has been scrambling activity in the ward; beds have been made, meals served, and dressings attended to—but how? How they should have been done can perhaps best be shown by sketching an orderly ward and the manner of caring for the sick in it.

It is a ward say of sixteen or twenty beds, and a number of the cases are serious ones. There are a first nurse and two others, her assistants. The matron's part of the general cleaning will be well done by her servants later; the nurses only are on duty now. They have stopped a moment in the dining-room or ward pantry, and taken the cup of tea or coffee with a cracker, which should be ready for them, and they have begun promptly, reaching the ward at the moment the night nurse was relieved; there should always be an exactness amounting to "snap" about ward work, but snap does not mean "slam." The convalescents are already moving, having been directed to take the bedding off

their beds and hang it over the chair at the foot; to double back the mattress and shake up the pillow—it is the work of two minutes—and then go at once to the wash-room. Each patient takes with him his own towel, or better still, finds it ready on a peg numbered to correspond with his bed. There is soap enough, and hot and cold water, and each patient is expected to have in the stout, washable cotton bag hanging from the peg his tooth-brush, hair-brush, and comb. The washing over, the clothes put on, each patient can give a finishing touch to his toilet with a clothes-brush, several of which are hanging by chains fastened to the wash-room wall.

By this time breakfast is ready, and convalescents go directly to the ward dining-room, where one of the attendants superintends the meal. All this time the nurses have been busy with the helpless patients. They have brought in basins of warm water, soap, and towels, and have washed the faces, necks, and hands of their sick people; have smoothed their hair, given them water to rinse their mouths, and a bit of soft linen or their brushes to help in the cleansing. They have shaken up the pillows and straightened the sheets and bed covering, and taken away all basins, towels, and cups at once, leaving the tables cleared for the breakfast which is now to come. All this takes time; sick persons must not be hurried; a good nurse always recollects this. Just before the breakfast the nurse throws a light extra blanket over the patients who remain in bed, head and all, and opens the doors and windows for three minutes and lets the out-door air flow through

the ward. She then shuts the windows, turns down the blankets, and breakfast may come in. She finds that this simple freshening of the atmosphere makes the difference with some of the feebler patients between eating and not eating their breakfast. She has noticed that in private houses a sick person almost always eats with a better zest if he is able to bear being carried into another room for his meals. She cannot do this for her ward patient, but she does the next best thing she can for him. She brings a fresher atmosphere to him. In illustration of this matter it may be noticed that when the visiting doctor makes his rounds at dinner time and takes down the surgical dressings, three dinners are usually carried away untasted for every patient examined; the dinner of the patient himself and that of the person on each side of him. It often needs a robust appetite to overcome the ward associations.

Whatever the breakfast is it has been put on little trays in the dining-room by the person in charge there, in accordance with the diet-sheet, and is brought to the bed-sides. Whenever a patient can make out to feed himself, though the process may be a long one, he likes to do it, and he is propped up in bed with one end of a clean towel tucked in his neck, and the other pulled down over the sheet; then his little tray of food is put before him. Nurses in the well-ordered ward we are describing have put the liquid food not in bowls, but in small mugs with handles and broad bottoms, and the patients find it easy to sip what they want. If the patient is one who needs to be slowly fed by the nurse, the same

care as to propping up and protecting with a clean towel is taken, and the food is given in manageable mouthfuls.

Breakfast over, the nurse or convalescent appointed to this work carries away the cups and plates from the bed-tables and the nurses go to their own meal in turn. Patients who are up and about come back now to the wards, make their beds, and put their tables in order. All quilts are spread at the same height from the floor, and all furniture and bed-carpets put at the same angle to the beds. No extra clothing of any kind is allowed tucked about the tables or beds, every article not in use being laid away by the nurses at once in a locked, light closet or room, outside the wards—a well-ventilated closet—with numbered shelves or pigeon-holes to correspond with the beds, and numbered pegs for hats and overcoats in the case of men patients. Messes of all kinds are cleared from the tables, convalescents being required to keep their own tables neat, though in all these matters the nurses help and give directions.

By this time in an orderly ward it is nearly nine o'clock. The nurses have returned from their breakfast and now begin the washing of wounds, the bandaging, and changing of poultices, and the house physician goes his rounds accompanied by the first nurse of each ward, who gives him the report of the night which, for all serious cases, she has received from the night nurse in writing. This is the hour when the head nurse of the hospital will make a round of inspection, taking mental note of carelessness or inefficiency, for future use in instructing her

nurses. By ten o'clock in a ward of the size and kind described the dressings are finished and the untidy traces cleared away; all unsightly vessels have been removed and washed, all light brushing up and dusting is done, and the whole ward and its adjuncts are in readiness for the physician of the visiting-staff, who on his daily round of the wards is accompanied by the head nurse of the hospital and the first nurse of each ward in turn, the first nurse noting attentively all orders given, and writing down, as has been mentioned, any special directions for serious cases. If the attending physician's visit is made at a fixed hour every day, it of course helps very much in systematizing the ward work.

Medicines and stimulants are always kept in a locked closet in the ward, with divisions numbered to correspond with the beds, only the first nurse having access to the closet. The hours at which doses are to be administered are carefully set down by the nurse in her note-book for serious cases and crossed off as each dose is given. Some such little plan proves of great assistance in preventing unfortunate blunders. Convalescents come at the proper hour to the medicine closet, where the first nurse stands ready to give them their doses in accordance with the time noted for each on a slate hung by the closet. She has her bowl of fresh water and clean towel to wash the spoon or glass she uses for the patients in turn.

Perhaps this morning a new patient is to be admitted, and the head nurse has been notified by the superintendent to have a bed ready in this ward, and

word comes to the first nurse accordingly. The new patient is sick enough to be put in a detached room, but the resources of the hospital are not sufficient for this. The nurse tries therefore to isolate him as far as she can, by selecting a bed next one occupied by a convalescent, say, who will, if rules are obeyed, spend most of his time away from the ward. She clears away every superfluous article from table and window-sill. She carefully makes the bed with reference to a long occupancy, protecting the mattress with rubber sheeting, spreading over it and tucking in firmly on all sides the under sheet. Over this she again puts a rubber cloth covered by a draw-sheet, for the man on arriving must be bathed in bed. She adjusts the blanket, upper sheet, and quilt, folding them back toward the foot of the bed, and placing the pillows as she wants them. She has towels, soft cloths, soap, basin, clean night-shirt and socks ready, and the screens at hand to shut off this part of the ward for the time as much as possible.

Meanwhile the patient is to be moved to the hospital from some distant part of the town; taken it may be out of the small, tenement-house room which he has shared with all the other members of the family, who can ill spare him a warm wrap. If the hospital sends its own conveyance to fetch him, and the matter is put within the province of the head nurse, she will make sure that a blanket is sent to cover the man in cool weather, and a mattress and pillow if the case requires it. She will see that he is carefully carried to the ward on the mattress or stretcher, or, if not ill enough for that, but still

weak and forlorn, that there is ready a light, strong chair with arms, or a canvas seat, with waist-belt and slung between poles, in which he can sit while two men attendants carry him up.

He is in the ward now, or, if the hospital is a model one, in the ward reception-room or examining-room adjoining the bath-room ; at any rate, he is where the next step must be taken toward making him comfortable. If he is exhausted or excited by the drive, the nurse lets him lie or sit still for a while, giving him a little simple nourishment, a few spoonfuls of beef tea or a drink of milk ; no spirits without orders ; after which, with permission of the doctor, she proceeds to undress him and to see that he gets as gently as possible the bath which the rules of the hospital prescribe. Either the patient will be put into the tub by the men orderlies, or, if he is too feeble for this, the nurse will herself wash him thoroughly with warm water and a soapy cloth, as he lies on the bed she has prepared, lightly covered with a sheet, under which she passes her hand. A bath-brush should be used for the feet. Full directions for bathing patients are given in any good book on nursing, one of which should be in every ward.

In all cases the nurse should ask the doctor whether he sanctions the bath, and then should let no unwillingness on the part of the patient keep her from this duty. Having washed him, slipped away the draw-sheet and rubber-cloth, and dressed the man, she covers him up, gives him a little more nourishment if he is exhausted—Miss Nightingale's rule is that new patients are to be considered on

fever diet, that is milk diet, until such time as the doctor gives his own orders—and she leaves the screens about his bed to let him rest. He will probably fall into the best sleep he has had for many days. Now a window is let down in such a way that there is no direct draft upon him, for this warm bathing of unclean surfaces, when properly done, contaminates the air and the vapors must be got rid of. For this reason all bathing should be done out of the ward when possible.

The cloth clothing of the patient has of course before this been made into a bundle and sent to the cleansing-room, his soiled clothes to the laundry, and all his little pocket treasures have been taken charge of by the nurse, who first shows them to the man with the assurance that they are safe. The after care of the patient is in accordance with the directions given by the doctor, which will be implicitly carried out. A competent nurse sets down in writing all information likely to be called for as to pulse, temperature, secretions, etc., and is ready to answer the doctor's questions promptly. She moves quickly and quietly; she knows the name of her patient; she keeps his mind free from anxiety, and does not discuss him in his presence with any one except the doctor. She does not allow the bed-pan or urinal to be conspicuous, but removes all vessels at once, washing and rinsing them with disinfectants in the sink provided for the purpose. The vessel which must be at hand for instant use she keeps when washed out of view. All sights of sickness in general in this orderly ward are kept out of the way

as much as possible. This promotes cheerfulness as well as cleanliness, and cheerfulness is a medicine in itself.

. The first press of ward work is now over. The head nurse takes this time to find out whether all that is needed for the next twenty-four hours is on hand, and makes requisitions on the housekeeper for what she wants, keeping her requisitions copied in a book, for inspection by the proper authorities as an inventory of the supplies furnished her. This is a good hour, say between eleven and one o'clock, to send half the nurses off duty, and it should be insisted upon that three times a week at least they go away from the hospital entirely and into the open air. Their times for this recreation will necessarily depend upon the exigencies of the hospital service, and upon the hour at which the attending doctor makes his visit, but a watchful head nurse will see to it that her assistants are kept in good condition by out-door influences.

Dinner time comes now, and the rest of the day's care of the patients repeats the morning work. When the afternoon dressings are to be made, or baths given, the head nurse takes care to be on the spot to instruct those whom she noted in her morning rounds as inefficient. She calls the first nurse of the ward and has her do the work before her, or she does it herself and makes the assistant watch her in everything. By such pains as this, all hospitals, whether they have training-schools connected with them or not, become schools, and at any rate train their own attendants, to the very great advan-

tage of the institution. In the experience of the writer, and in that of most hospital visitors, men patients are more likely to be neglected than women. This is partly because they are usually less sensitive and less exacting than women patients, and partly because some women nurses when appointed to men's wards are kept from a quiet, simple, official performance of duty by mock modesty ; while men nurses, whom it is the custom to employ in some hospitals, are in every way a notoriously inferior class. Dr. Gross hardly overstates the case when he says that "in the experience of the American physician, drunkenness and male nursing are almost synonymous terms."

A hospital always has, or should have, its own general rules concerning bathing and out-door exercise, which it is the duty of the head nurse to see are observed. All patients, unless forbidden by the doctor, should be compelled to wash their whole persons twice a week. Those who are in bed should be sponged daily. All patients able to leave the ward should be sent out of it, and kept out as often and as long as possible ; in this way the air remains purer for those who must stay in bed, and the convalescents themselves are put in healthier surroundings. Some sheltered piazza where wheeled chairs can stand, some room on the same level with the main ward where newspapers and games can be kept, are humane provisions in any hospital and essential to the best conditions for recovery.

Musical instruments in a hospital are good things if they are managed with good sense and strict re-

gard for the comfort of the majority. In certain stages of illness and convalescence the soft, long-drawn strains of good organ music, or of a sympathetic human voice, are soothing and delightful. On the other hand, the loud, sharp stroke of a piano-forte played in season and out of season, and played in the false and slipshod manner common in such places, is exceedingly irritating to the nerves of many sick persons, and therefore positively injurious. Sore complaints have been made to the writer by hospital patients on this subject. If musical instruments are kept near hospital wards no such thing as "practicing" or indiscriminate thrumming for private amusement should on any account be allowed. If it is difficult wholly to prevent this abuse of instruments, they should be kept in some room out of hearing of the sick, and moved near the wards only on occasions of general worship or entertainment, or at times when they can be well and judiciously played for the comfort and pleasure of all.

VIII

CARE OF THE INSANE.

THE proper construction and management of hospitals for the insane form a distinct subject. Many of the details as to general care and hygiene already given will apply to such hospitals. It can only be said here in addition that visitors must make constant effort to have the law enforced which forbids the detention of insane persons in any other place than a State lunatic asylum or public or private asylum for a longer period than ten days. (See Appendix.) The majority of such patients, to insure any hope of recovery, require prompt treatment, special appliances, trained attendants, generous diet, and all the skill which experts in lunacy can bring to bear on the case. All these can best be secured in large establishments which command the right sort of professional service, and where the concentration which, to a certain point, is allowable will economize some of the heavy expenses that proper treatment of acute and violent cases entails. The sooner acute cases can have the advantages described, the larger will be the percentage of cures. The burdens of taxation are enormously increased by delay in this matter. For while the slow pro-

cess of building the massive and costly structures for the insane, hitherto thought necessary, is going on—"structures, a small portion of which only will ever be occupied by violent patients"—the insane poor are waiting in town or county poorhouses destitute of appliances, with wretched poorhouse food, and without medical care; and acute cases, which might be cured under prompt and proper treatment, are passing by neglect and delay into the chronic and hopeless state.

Provision for the chronic insane has been made in some of our counties, but it is painfully inadequate for the large and increasing numbers. This association questions the wisdom of multiplying small county institutions for the care of either acute or chronic insane—cramped for resources, with poor outfit, and dependent on some slenderly educated, half-paid, often hard-driven local practitioner. A wiser plan would seem to be to occupy part of the ample grounds of the present State Asylums with groups of cottages, the cost of construction being limited to \$500 per capita. The appliances and the professional service of the main institution would be available, and in case of any access of mania the patient could be removed to the appropriate ward. An instance of what may be accomplished in this direction is seen in the Willard Asylum, at Ovid.

Professor Sanborn, Secretary of the Social Science Association, tells us he has observed that the infirm and aged poor not infrequently pass into the demented state wherein we find so many of the chronic insane; and he advises that the same sort

of shelter and care be provided for both these classes of persons, the provision made being as distinct as practicable from that of an almshouse. The need of nourishing food, cheerful surroundings, and light in-door and garden occupation must be borne in mind.

In one instance known to the writer a harmless lunatic in a neighboring State two years ago was found in the barn of the poorhouse, chained like a wild beast—a brutality committed no doubt through ignorance and fear, to keep the man secure and save the trouble of attendance. The condition of the insane, especially that of the insane poor, is pitiable indeed. They are even more helpless than children. Their word goes for nothing; they have literally, in one sense, no friends—not even themselves. They need every safeguard which can be thrown around them. Ignorance is cruel. Fear is cruel. And this most helpless of all classes may not infrequently suffer through ignorance and fear. Insane hospitals are of necessity often built in secluded places; they are less open to ordinary public inspection than other charities; and there is therefore greater need that visitors should carefully note the number, character, and capacity of the attendants and the manner in which the service is organized. Medical superintendents of insane hospitals usually combine a number of offices in their own person; they are frequently overworked; they are called to distant places for consultations. The plan of keeping every detail of hospital management in their own hands which many of them pursue is

impossible in fact, and breaks down at some point or other from the mere nature of things. A certain amount of authority must be delegated, but it should never be delegated direct to the lowest grade of attendants, but should be distributed through faithful heads of departments and divisions. Even in the finest hospitals, with a large corps of nurses, the service can never be of the best quality without organization and without intelligent and high-grade oversight.

Visitors might well consider the account published in the *Boston Medical and Surgical Journal*, for 12th August, 1875, of a Scotch insane asylum; also quoted by Dr. H. B. Wilbur in the Ninth Annual Report of the State Board of Charities of New York, 1876. This is the pauper asylum for the counties of Fife and Kinross, and holds two hundred and eighty inmates, both chronic and acute cases. One attendant is allowed for every twelve patients. The features which distinguish the asylum are: unlocked doors for all but the violent cases; a great amount of general freedom; regular occupation—the work in the garden, the laundry, the kitchen, and sewing-room, making the asylum a bee-hive, and reducing the number of the actually idle to a minimum; lastly, the disuse of airing courts. The physician in charge, Dr. John Fraser, the successor of the well-known Dr. Tuke, says, “Airing courts are a mistake, especially for females; the airing-court system permits every insane propensity to run to weeds.”

The introduction of labor-saving machinery in a

class of asylums where occupation should be one of the regular methods of treatment seems a questionable policy. At the Northampton (Massachusetts) Insane Hospital fifteen or twenty patients are constantly employed in the laundry, to their own benefit and to the saving of the institution. The advantages of light out-door occupation in suitable weather cannot be over-estimated.

The above suggestions are in accordance with the views of Dr. John Ordronaux, State Commissioner in Lunacy, N. Y., and of Mr. Francis Wells, of the Pennsylvania Board of Charities, Dr. H. B. Wilbur, and others, in valuable papers read in the Conference of Charities held at Saratoga, September, 1876.

IX

MATERNITY WARDS.

IN regard to maternity wards, visitors should consult Miss Nightingale's excellent little book, *Notes on Lying-in Institutions*. Maternity cases should never be allowed in a general hospital, and this plan, wherever tried, is sure to be abandoned sooner or later after disastrous results.

Professor Erichsen, in his *Lectures on Hospitalism*, before quoted, says: "It is well known that it is absolutely impossible to establish a maternity ward in a general hospital without exposing the women confined in it to the greatest possible peril of life; and in every instance, I believe, in which it has been attempted in London, the mortality has been so great that it has become necessary to close the ward. The fact is certain that a woman has a better chance of recovery after delivery in the meanest, poorest hovel, than in the best conducted general hospital, furnished with every appliance that can add to her comfort, and with the best skill that a metropolis can afford. The statistics of Lefort on the rate of mortality following the delivery of nearly two million women in different parts of Europe—one half in their own homes, and the others in lying-in hospitals

—are so distinct and definite in their results as to leave no doubt.” The figures are these :

DELIVERIES.	DEATHS.
At Home . . . 934,781.	4,015, or 1 in 212.
In Hospital . . 888,812.	80,594, or 1 in 82.

In considering the great body of facts which the history of both hospital and private obstetrical practice furnishes, the late Dr. Joseph M. Smith says: “There are two things which cannot fail to be suggested, and to make durable impressions on the mind. The first is the importance of preserving in absolute purity the persons, clothing, and bedding of the inmates, and also the floors, furniture, and atmosphere of lying-in hospitals; and in case puerperal fever manifests itself, of adopting the most prompt and efficient means of extinguishing it—such as ablution, ventilation, fumigation, and, if necessary, dispersion of the patients. The second is the imperative duty of physicians ever to bear in mind the danger of their becoming agents of disseminating the disease in epidemic puerperal fever seasons, and to observe every precaution against such accidents. If, indeed, there be any moral obligation resting on a medical man to his patients paramount to every other, it is that of refraining from attending a woman in labor, if there be the slightest chance of his conveying to her the germ of a mortal disease.”

The chief points to be regarded in the construction and management of a maternity hospital are the prevention and exclusion of all local and all outside causes likely to create puerperal fever.

Dr. S. H. Chapman writes: "There should be (1) complete isolation of the buildings themselves, and (2) such internal watchfulness that the chance of local production of disease may be reduced to the smallest possible ratio. For a suspected case, a separate room should be provided, and all wards should be periodically emptied and disinfected. Blankets and sheets should be baked and boiled after one using, and none but wire-gauze beds should be allowed. The system of ventilation should be as perfect as nature and science can make it, and the temperature of the wards should never be above 68° Fahrenheit. There should be separate nurses and helpers, and no communication allowed with fever patients or suspected cases. Strong discipline should be held in a maternity hospital over the physicians themselves, both resident and attending ones, as well as over nurses, in the matter of rigid cleanliness and of non-intercourse."

The State Charities Aid Association, in its Annual Report for 1875, recommends that for obstetrical cases a sufficient number of one-story pavilion wards should be provided, to be used alternately, and containing each never more than six beds. This is in view of a large hospital, and a large number of births annually. But poorhouse authorities and the managers of small hospitals where lying-in cases are occasional, should provide one or two cottages for this special use, distinct from the main house or hospital wards. The cottages can be built on the same plan as the isolating hut described in the Appendix, except that, to contain two beds for women

and a third for a nurse, they should be twenty-five feet square instead of twenty feet. In calculating air-space and the number of attendants it must be remembered that "one mother implies two patients, unless it is proposed to kill the babies."

X

CONCLUSION.

IN conclusion let us return for a moment to the object for which our hospital building, its corps of nurses, its outfit, its superintendence exist, and to which they should be so carefully adapted. Let no one forget that this primary object is the curing of the sick. A hospital is not founded solely to provide a field for experiments and break in raw young medical men to practice. It is not founded and supported, or should not be, to furnish "jobs," to harbor malingerers, or to make places for professional or political "friends." The great motive, at any rate from the hospital visitor's point of view, is charity, but charity in a certain direction ; therefore a hospital should not become a mere almshouse or asylum for incurables ; necessary as such public charities are, they are apart from the purposes of a hospital. The ambition, which sometimes exists, to over-crowd, to run up the numbers, and show at the month's or year's end a long list of admissions and consequently less average expense, or less average mortality, often blinds hospital authorities to the moral as well as the sanitary evils of such a course. This is a matter which visitors have a right to look

into, and they should notice whether any of the inmates are more properly almshouse cases ; or convalescents who are unwisely detained ; or station-house cases, such as inebriates, making use of the institution as a temporary shelter during a fit of excess ; or mere hospital lodgers, it may be, waiting " until after the election."

But in all inspection, let visitors bear in mind that hasty observation and loose generalization are worthless. Criticism on any branch of hospital organization will be valuable only so far as it is founded on actual experience and study. Intelligent visitors will learn the best methods of caring for the sick and insane and dependent classes ; they will inform themselves of the laws bearing upon any subject ; they will read the best books and reports, and so far as theoretic study can be of use, will educate themselves for the responsible position they have assumed. They will not confine themselves to ministrations to individual patients, for while these have their place and are pleasant and acceptable to the sick, there is a broader duty laid upon the members of this association. They will remember that they enter institutions of public charity in some sense as inspectors for the State, and they will use the opportunity which frequent visiting gives to study intelligently not only details, but systems and the faults of systems. They will perceive that they cannot immediately and single-handed redress wrongs or work reform in matters which may have been gradually going awry for years ; but they will accurately record facts and make report thereon to the proper

officer of their committee, adding such recommendations as their close observation and experience ought to suggest.

In most public institutions there is apt to be a certain amount of "getting ready for the committee." Managers make their visits at fixed periods, once a week, or once a month. Their coming is announced, at all events known; the wards are scrubbed; the ventilating fan is set going; the water works are all right for the time; attendants are at their duty; clean quilts are spread over dirty sheets; rubbish is swept into corners, and the matron or superintendent is at the committee's elbow to divert attention from doubtful places. At best it is "a dress-parade in which the managers are the inspecting officers." Visitors must not allow themselves to be misled by such a hasty smoothing over of things on the surface. Their visits, to be effective, besides being frequent and leisurely should be made at irregular and unexpected times.

Visitors should note the original cost and current expenses of any institution, and consider in what items the money seems to be consumed; what is the quality of the supplies furnished; how the labor of the household is organized; whether the hospital service is properly graded, and the oversight and the discipline what they should be; whether precautions are taken to keep the sexes separate, and what safeguards are employed against fire; whether the systematic use of disinfectants is understood by the superintendent and matron, and the isolation of nurses as well as patients during and after infec-

tion is attended to. They should ascertain what salaries are paid, whether these are inordinate, or are such as the officers deserve, or are inadequate to command the best service. They should especially observe the character and tone of the superintendence, and whether the chief officer is a competent person. To keep a set of books and transact the office business is not the whole of management. The *spirit* in which the work is conducted is all-important. "The superintendent gives tone to his institution. The attendant never will be more careful and considerate of the interests and welfare of the patients than his superior officers are. A selfish and neglectful superintendent, one who is engrossed with other occupations than the restoration of health and the humane treatment of the patients intrusted to his care, will have in his institution attendants no less selfish and neglectful than himself." * As Dr. John M. Woodworth says: "To fill administrative positions in public charities as they are sometimes filled for political considerations, or for qualifications other than those of competency and fitness, should curse any man or body of men who by so doing jeopardize the lives of their fellows."

Bricks and mortar will not make a good hospital, neither will half a million of money. The factors are few and simple: clean air, clean water, good plain food, plenty of clean bedding and clothing, enlightened medical care, trained nursing, and a pure and cheerful moral atmosphere; above all, and

* Dr. J. L. Bodine, *Proceedings of the Conference of Charities*, held at Saratoga, September, 1876.

including all, honest, intelligent administration. Yet the healthiest site, the most finely equipped building, the most carefully devised rules will be elaborate failures, without common sense and good will and a ready co-operation among managers, committees, visitors, doctors, and nurses. The common-sense virtues are particularly needed in public hospitals, where there are frequently among the patients impostors and vicious and degraded persons. But the poor are a direct legacy to us from the gracious Founder of our faith. Let us not therefore be afraid of the name of sentimentalist, or hesitate in bringing to our work all the refined resources of Christian love.

APPENDIX.



APPENDIX.

(A.)

PRINCIPLES OF HOSPITAL CONSTRUCTION.

From the Fourth Annual Report of the State Charities Aid Association, 1876. Extract from Report of the Standing Committee on Hospitals.

"OF so much importance is the subject of hospital construction at the present time, that we conclude our report by stating in concise terms the principles which should be adhered to in the erection of a general hospital.

I. A site should be selected which affords the best sanitary conditions—removed from sources rendering the air impure, and from surrounding obstructions to its free circulation. Rather than erect a hospital in a crowded district, surrounded by buildings, it is better to place it as far as practicable from the center of population, and to have in connection with it a system of small reception hospitals, containing not more than six beds, with ambulance wagons for conveyance of patients.

II. The grounds should be well drained and cultivated, so as to give a large supply of foliage.

III. The administrative building, drug-room, kitchen, laundry, and bath-house should be separated from the wards and to the leeward, so as not to obstruct the prevailing winds during the summer months.

IV. The post-mortem, pathological, and dispensary buildings should be separated, in fact, isolated, from the rest of the hospital, and have a different set of medical men and attendants.

V. The patients should be divided according to their diseases into not less than four classes :

Class 1st. Non-infectious cases, and those not liable to become

infected or to infect others—as rheumatism, disease of the heart, liver, kidneys, etc.

Class 2d. Non-infectious cases, and those not dangerous to others, but liable to become infected—as slight wounds, scalp-wounds with fracture of skull, etc.

Class 3d. Non-infectious cases, but liable to become so, and dangerous at all times to others—as severe wounds, burns, etc.

Class 4th. Infectious and contagious cases—as pyæmia, septicæmia, erysipelas, gangrene, etc.

VI. For the treatment of all classes of patients, it is *very desirable* to have every ward in a separate one-story pavilion; for the treatment of cases coming under classes second and third, it is *essential* that the wards should be in one-story pavilions. For the treatment of class fourth, isolated huts or tents are *absolutely necessary*.

VII. The pavilions for the first and second classes may be permanent in character, but those for the third class should be more or less temporary. Those for the fourth class should be frequently destroyed and renewed.

VIII. Every pavilion should consist of two distinct parts:

(a) The ward, placed on a high basement made permanently dry, with its axis running north and south; say 30×100 feet, allowing at least 120 feet of surface area, and high enough to give not less than 1800 cubic feet of air-space to each bed. There should be one window to each bed. In the temporary pavilions for severe cases, the surface area and the cubic air-space for each bed should be much greater.

(b) The service-room building, containing the dining-room, water-closets, etc., should be near the north end of the ward, connecting with it by means of a short corridor, thus leaving both ends of the ward free, and diminishing the risk of infection from the service-rooms.

IX. The pavilions should be distant not less than three times their height from each other and from all other buildings.

X. Unless the severity of the climate demands a closed corridor, the communication between the buildings should be by open walks, under a covered way, with tramway-carriages for conveying food and patients to the wards. If corridors are used, the walls should be raised high enough to allow the corridors to be

raised wholly above the ground, and have their tops serve as walks, on a level with the floor of the wards.

The corridor should connect with the service-rooms and not with the wards.

XI. The object in ventilation is to secure a *frequent and complete* change of the air in the wards.

For ventilating and heating one-story buildings, such as we have proposed, the simplest and most successful method is by means of open fires. Hot water as an auxiliary should be used in preference to steam or hot air.

XII. The number of beds in the hospital should be great enough to permit three or four beds in each ward to be always empty, and the number of wards should be sufficient to allow one in twelve to be vacated, and left open to the air and light for purification.

XIII. A lying-in service should never be carried on in connection with a general hospital.

We are not forgetful of the fact that the success of a hospital depends more upon its good management than upon the character of the building, but we are satisfied that, even with good management, the majority of hospitals now in use cannot be made to give results that will equal those to be attained in a properly constructed hospital.

For the Committee,

W: GILL WYLIE, M.D.,

Chairman.

The undersigned indorse the above principles :

Mrs. Ethan Allen.	Mrs. C. R. Lowell.
C. R. Agnew, M.D.	Levi P. Morton.
Jas. W. Beekman.	Prof. J. S. Newberry.
C. L. Brace.	Fred. Law Olmsted.
John Crosby Brown.	John Ordronaux, M.D.
Prof. C. F. Chandler.	Henry E. Pellew.
Mrs. P. M. Clapp.	Carl Pfeiffer.
Miss Ellen Collins.	Howard Potter.
A. B. Crosby, M.D.	Henry C. Potter, D.D.
R. H. Derby, M.D.	James Roosevelt.
Wm. E. Dodge, jr.	Theodore Roosevelt.
Mrs. d'Orémieulx.	Mrs. Wm. B. Rice.

Mrs. Alex. Hamilton.	Miss Sands.
Elisha Harris, M.D.	Miss Schuyler.
John H. Hinton, M.D.	Gouverneur M. Smith, M.D.
Mrs. Joseph Hobson.	Stephen Smith, M.D.
Mrs. Lydig M. Hoyt.	John M. Woodworth, M.D.
Prof. Chas. A. Joy.	Miss Woolsey.

(B.)

ISOLATING COTTAGE.

Intended for infectious cases developed after admission; built on the grounds of the Presbyterian Hospital, 70th St., New York, January, 1876.

The cottage is raised on locust posts a foot high, the space under the cottage having been excavated and then filled with ashes and concrete. Asphalt is a better material, the object being to secure a perfectly smooth surface or pavement under and around the building, so as to furnish no lodgment for dampness or dust. There is but one room, twenty feet square with gable roof. There are two beds for patients, and one for a nurse screened off by a wooden partition which includes one of the windows. The windows are five feet by three, and of good quality of glass, and the building has light and air on all four sides. The roof, walls, and floor are double, and the interspace is ventilated by means of hinged boards opening outwards at the top and bottom of the outer wall. The upper floor is of Georgia pine well laid. Registers open under each bed, and from these, between the floors, run tin tubes for drawing the foul air away. These tubes unite behind the stove in one flue which encases the smoke flue. The stove is an open Franklin; the pipe being double, the inner smoke flue warms the space around it, and makes an aspirating chimney for foul air on a small scale. Fresh air descends into the room through box-shafts which reach down from the roof below the level of the eaves, and are fitted with an adjustable scatter-plate at their mouths. There are also transoms over the door and windows to assist in ventilation. The

cottage was tested for the first time during a heavy snow-storm in the month of February, when the thermometer outside fell to 7°. After the first day or two, being thoroughly warmed and dried, it was kept comfortable with a temperature ranging from 65° to 75°, night and day, and although then used for a bad case of exsection the air was always clean and good. The cost of the cottage without concrete pavement, and without stove and furniture, was \$279.

(C.)

CHLORINE DISINFECTANT.

The proportions for preparing chlorine disinfectant are given by Professor Charles E. Joy, Professor of Chemistry, Columbia College, as follows :

- | | | |
|-----|---|------------------------------------------------|
| 1st | { | 8 parts by weight of black oxide of manganese. |
| | { | 10 " " " of table salt. |
| 2d | { | 24 parts by weight of sulphuric acid. |
| | { | 12 " " " of water, to dilute it. |

Mix the dry powder thoroughly ; also stir the sulphuric acid into the water and allow it to stand for a few minutes—each separately.

One pound of mixture No. 1 and two pounds of acid No. 2 thoroughly incorporated by stirring (and gently warmed as by the presence of hot steam in the room) will yield about three and a half cubic feet of pure chlorine gas. This quantity of gas would suffice, if the ward to be disinfected be kept closed for some hours. The mixture should be divided into three or four parcels in porcelain or glass pans, and disposed in different parts of the room, especially on a shelf or high place, as chlorine is very heavy and will descend.

(D.)

The following diet table and the rules for patients and nurses have been in successful use for several years in a New York city hospital. They are offered merely as suggestions.

HOUSE DIET.

SUNDAY.	MONDAY.	TUESDAY.	WEDNESDAY.	THURSDAY.	FRIDAY.	SATURDAY.
BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Porridge.	BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Mince or Stew.	BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Porridge.	BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Mince or Stew or Fish, fresh or salt.	BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Porridge.	BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Fish Hash or Meat Hash.	BREAKFAST. Coffee or Tea, Bread or Toast, Butter, Porridge.
DINNER. Roast Beef, Potatoes, Tomatoes, Beet Salad or Coldslaw, and Crackers and Cheese.	DINNER. Soup. Mutton, roast or boiled, Potatoes, mashed, One other Vege- table, Pickles, Apples or Oranges	DINNER. Corned Beef, Turnips or Cabbage, Potatoes, Coldslaw, Pudding.	DINNER. Soup, Roast Beef, Potatoes, mashed, One other Vege- table, Pickles, Apples or Oranges	DINNER. Mutton, roast or boiled, Onions or Turnips or Cabbage, Potatoes, Pudding.	DINNER. Fish, fresh or salt, Potatoes, Beets or Parsnips, Coldslaw or Pickles, Apples or Oranges	DINNER. Mince or Stew, Potatoes, mashed, One other Vege- table, Pudding.
SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed or baked Apples.	SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed Peaches.	SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed Peaches.	SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed or baked Apples.	SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed Peaches.	SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed Peaches.	SUPPER. Coffee or Tea, Bread or Toast, Butter, Stewed Oysters.

The PORRIDGE will be Oatmeal or Wheaten Grits or Indian Meal Mush, or Farina or Hominy, changing at least every second day.
 The BREAD will be $\frac{1}{2}$ Wheat Bread, $\frac{1}{4}$ Rye or Cornbread.
 Fresh Fruit and Vegetables occasionally in season.
 Poultry occasionally in season.
 The above table will not be altered in any respect without instructions from the Superintendent.
 Nothing whatever will be issued from the Kitchen without instructions from the Superintendent, or a written order from the House Physician.

(E.)

QUANTITIES OF COOKED FOOD, FOR ONE MEAL, FOR ONE PERSON.

Soup, gruel, milk, etc.....	pt. 1
Meat, fresh or salt.....	oz. 6
Fish, fresh or salt.....	oz. 6
Vegetables.....	oz. 4
Pudding, porridge, etc.....	oz. 6
Bread.....	oz. 4
Butter.....	oz. 1
Sugar.....	oz. 1
Cheese.....	oz. 1
Pickles.....	oz. 1
Stewed fruit.....	oz. 2
Molasses (10 persons).....	pt. 1
Syrup, do.	pt. 1
Vinegar, do.	pt. $\frac{1}{2}$

The above quantities have been found abundant, the supplies being issued for the total number, and there being always a certain number who do not take some of the articles.

(F.)

RULES FOR PATIENTS.

1. Patients in this hospital are forbidden to use profane or indecent language; to express immoral or infidel sentiments; to play at any game for money; to smoke tobacco in the house; to procure for themselves or others any intoxicating liquors, or to have or circulate any book, print, pamphlet, or newspaper of a vulgar, immoral, or indecent character.

2. No patient shall go into the dead-house, engine-rooms, laundry, kitchen, theatre, pharmacy, or public offices, or into any of the officers or attendants' rooms, except on special business, or

by special permission ; nor shall any patient leave his or her ward without the knowledge and consent of the head nurse.

3. No male patient shall go into the women's wards, nor any female patient into the men's wards ; nor shall any patient leave the house without a pass properly signed by the house physician and countersigned by the superintendent.

4. All patients will remain quietly in their places during the visits of the physicians.

5. Convalescent free patients are required to assist in any light work which the physicians do not disapprove.

6. Convalescents will be responsible for the neatness of their beds and bedside tables, and all patients, able to do so, will rise before breakfast, and go into the ward dining-room for their meals.

7. Patients are required to comply promptly and cheerfully with the requests of the nurses, and behave themselves at all times in an orderly and quiet manner.

8. Willful disobedience of these rules will subject the offender to dismissal from the hospital. Willful injury of the water apparatus, or of any furniture or property, will subject the offender to dismissal.

RULES FOR NURSES AND ATTENDANTS.

1. Hospital attendants shall be employed, with the approval of the managers, in such number as the services of the hospital may require.

2. They shall be under the control of the superintendent, and of the heads of the several departments in which they may be employed.

3. As far as practicable they shall have assigned to them their regular duties, but will be expected to yield willing obedience to any reasonable requirement.

4. They shall give at least one week's notice to the superintendent of their intention to leave the service of the hospital, and may require the same notice when discharged, unless they be dismissed for gross misconduct.

5. They shall not leave the hospital without the permission of the superintendent, who shall assign them their regular hours of duty and recreation.

6. Those assigned to the wards as nurses shall attend to the

general order of the ward and comfort of the patients, and behave themselves with proper respect and decorum during the visit of any of the medical officers of the hospital.

7. No officer, nurse, or other attendant shall receive any compensation, gift, or bequest from any patient, unless authorized to do so by the managers, through the superintendent.

8. No male nurse shall go into any of the women's wards or offices, and no female nurse shall go into the men's wards or offices without special permission.

9. Nurses are not allowed to visit any other ward or its offices, either on or off duty, without special permission.

HEAD NURSES.

1. Must maintain quiet and order in their wards; must accompany the house physician and visiting physician on their rounds, give entire attention to their instructions, and be ready to inform them correctly as to the condition of the patients.

2. They will be held responsible for the entire charge of their wards; for the nursing of the sick, cleanliness, warmth, ventilation, and general discipline; and for the care and safety of all public and private property. They must study the interest of the hospital in preventing waste and destruction.

3. They must see that the proper bed-card accompanies every patient, and that the card is sent to the house physician on the death or discharge of the patient.

4. They must announce death, and, if possible, the approach of death, to the house physician and the superintendent, and upon the death of any patient must have the body immediately cleansed and carefully laid out by the assistant nurses, and at once quietly removed from the ward, under the direction of the house physician.

5. They must see that the order books are sent to the pharmacy immediately after the medical visits; that the medicines correspond with the orders; that the medicines and stimulants are correctly given; that the diet is correctly distributed, and that the specific instructions put up in ward wash closets, linen closets, etc., are exactly obeyed.

6. They must instruct the night nurses as to the care of the patients during the night, and require of them an exact account of the condition of the patients in the morning.

7. They must at once report to the superintendent any disobedience of orders or unnecessary noise or disorder on the part of attendants, patients, or visitors to patients.

8. When they leave their wards, for business or recreation, they must regularly assign an assistant to take charge during their absence, so that the wards may never be without a responsible head.

ASSISTANT NURSES—DAY.

Must aid the head nurse in any way he or she may require, their specific duty being to wait on and keep tidy all helpless patients, and to keep beds, bedside tables, ward furniture, and utensils of every kind in good order, and perfectly neat and clean.

ASSISTANT NURSES—NIGHT.

1. Must aid the head nurse in any way he or she may require.

2. Must see each and every patient in their wards at least once every half hour; must have all lights put out or turned low at or before 9 P. M., and enforce perfect order and quiet all night in the wards, adjacent halls, and stairways, reporting to the head nurse any disobedience or disorder.

3. They must transmit to the head nurse any instructions they have received from the physician during the night, and inform him or her exactly as to the condition of the patients in the morning.

4. They must at once report to the house physician any sudden unfavorable change in the condition of the patient.

5. They must observe, with great care, the atmosphere and the temperature of the wards, especially in the *early morning hours*, and endeavor to keep the temperature uniform, and the air *perfectly pure and sweet*. This will be accounted one of the most important duties of the night nurse.

The hours of duty will be for

DAY NURSES, - 6 A.M. to 6 P.M.

NIGHT NURSES, 6 P.M. to 6 A.M.

Any nurse requiring medical advice will so report to the superintendent. No nurse will be allowed to go off duty or apply for medical advice, except in cases of accident, without the knowledge and approval of the superintendent.

(G.)

FURNITURE FOR ONE WARD OF TWENTY BEDS.

Wire-woven bedsteads.....	20
Bedsacks for straw, if used.....	20
Hair mattresses, if used.....	20
Pillows, hair.....	20
Pillows, feather.....	20
Sheets.....	120
Blankets (40 pairs).....	80
Coverlets.....	40
Draw-sheets.....	120
Rubber sheets.....	20
Rubber pillow cases.....	10
Hand-towels.....	144
Bath-towels.....	60
Roller-towels, for pantry.....	12
Crash-towels, do.....	24
Table-cloths.....	6
Musquito nets.....	12
Chairs.....	30
Boston rockers, leather seat cushions.....	6
Rolling chairs.....	2
Extension chairs.....	2
Bedside tables, with drawer.....	20
Commodes.....	3
Bed rests, hard wood.....	6
Bed trays, do. do.....	6
Ward table, large.....	1
Dining-room table.....	1
Pantry table and dresser.....	1
Refrigerator, small.....	1
Looking-glasses, good quality.....	4
Towel-racks.....	4
Foot tubs.....	4
Foot-warmers, block tin.....	6
Tin basins.....	6
Crockery pitchers and basins.....	2

Glass lotion basins.	6
Nail brushes.	12
Dressing-combs	12
Crockery bed-pans.	6
Glass urinals.	12
Crockery chamber vessels, covered.	6
Expectoration cups.	20
Spittoons.	4
Soap dishes, no covers.	8
Bed screens.	6
Gas stove.	1
Clock.	1
Match safes.	6
Brass basins, graduated sizes.	4
Spirit lamp.	1
Plaster heater.	1
Surgical tray or table.	1
Shears.	2
Spatulas.	2
Oakum basket.	1
Bandage basket.	1
Refuse cans, galvanized iron.	2
Saucepans, graduated sizes.	4
Brooms, common.	2
Broom, hair.	1
Birch brooms for water-closets.	2
Dust-pan.	1
Dust-brush.	1
Thermometers.	2
Water cooler.	1
Water pitcher.	1
Dish pans.	2
Pint bowls.	24
Dinner plates.	24
Tea plates.	24
Cups and saucers.	24
Knives and forks.	24
Carving knife and fork.	1
Spoons, large.	24

Spoons, small.....	24
Feeding cups.....	6
Tumblers.....	24
China mugs, half-pint.....	24
Castors (1 set).....	1
Block tin pitchers, 1 quart.....	2
China pitchers, graduated sizes.....	6
Sugar bowls.....	2
Knife tray.....	1
Tea tray, large.....	1
Tea trays, small.....	6
Tin teapot.....	2
Corkscrews.....	2
Salt sifters, large.....	2
Medicine cupboard, hanging.....	1

(Stationary medicine boxes on ward tables are objectionable ; still more so are open racks of shelves on tables, in which liquors and opiates are accessible to every one.)

(H.)

STATE OF NEW YORK.

OFFICE OF THE

STATE COMMISSIONER IN LUNACY.

Roslyn, Queens Co., June 29, 1875.

TO THE SUPERINTENDENTS OF THE POOR:

Gentlemen—Owing to frequent misinterpretations of those provisions of the Act of 1874 (chap. 446) which relate to the commitment of the insane and the duties of superintendents and overseers of the poor, and in order to answer comprehensively the many inquiries addressed to the Commissioner upon these subjects, he deems it his duty to give the following synopsis of the legal intent of such provisions:

PLACES OF DETENTION.

A lunatic dangerous to himself or to others may be arrested by any one and temporarily detained in any suitable place, provided it be done in a humane manner, until his condition can be legally inquired into. But he cannot be *retained* for more than *ten days* in *any* place, except a State lunatic asylum, or such county asylums as have been authorized by *legislative* enactment to care for all their own insane. (Tit. I., Art. 1, §§7 & 8.)

The condition of such lunatic *must* be inquired into, and his removal to some asylum as above stated *must* be effected within *ten days*. Questions relating to convenience of county or town officers, to distances from State asylums, or to costs of transportation, do not justify any omission to comply with the foregoing provisions. The law is imperative as well as mandatory in its language, and admits of no exception, save where from dangerous illness the life of the person would be imperilled by his immediate removal. But as soon as it can be done with safety it must be. At this point, however, our municipal law, seeking the greatest possible good for the insane, makes a distinction between cases of *acute* and cases of *chronic* insanity. This distinction is founded upon the medical experience of the curability of recent insanity by early treatment. All persons whose insanity has lasted *less than one year* are included in the class of *acute* cases; and these, by reason of their assumed curability, *must* be sent to some State lunatic asylum, other than the Willard, within *ten days*. No exception to this provision is permitted outside of those counties having special *legislative* authority to treat all their own insane.

On the other hand, persons whose insanity has lasted *more than one year* are deemed *chronic* cases, and they, too, *must* be sent within ten days either to the Willard Asylum or to some one of the State asylums, or to such county asylums as may have been exempted by the State Board of Charities from the operations of the Willard Act. But this exemption does not *in any event* authorize such counties to detain *acute* cases in their local asylums for more than ten days, because such county asylums are not places to which cases of acute insanity can be *legally* committed. Every detention, therefore, of a case of acute

insanity in them beyond ten days is a misdemeanor, punishable by fine and imprisonment. (Tit. I., Art. 1, §10.)

There has been a growing laxity of compliance with the foregoing provisions in many counties, and particularly in those exempted from the operations of the Willard Act. An evident misconception has arisen touching the true scope and purport of such exemption. It does not seem to be sufficiently understood that the authority granted by the State Board of Charities to certain counties to care for their own insane limits them to the chronic class alone; nor that the Board may revoke such authority at any time, when in their estimation it is improperly used. The detention of acute cases in such county asylums is an improper use of such authority. (Chap. 713 of 1871, §§1 & 2.)

The wrong done to the insane in thus jeopardizing their chances of recovery, and the additional burden cast upon counties and the State by this process of manufacturing cases of chronic insanity, are violations of law, which it is in the power of superintendents of the poor to prevent, without waiting for suits to be instituted against them.

The Commissioner regrets to say that instances of the foregoing violations of law have repeatedly been brought to his notice, and frivolous excuses relating to convenience of officers, distances from State asylums or costs of transportation, been pleaded in extenuation thereof. It is needless to repeat that the law can give no heed to excuses of this kind. Superintendents of the poor have very large powers granted them over the pauper insane (Tit. I., Art. 1, §5), and their responsibilities for an efficient discharge of their official trust are correspondingly great.

DUTIES OF OVERSEERS OF THE POOR AND KEEPERS OF POOR-HOUSES.

The overseers of the poor, although in many cases independent officers, are yet, in certain respects, subordinated to the county superintendents in matters appertaining to lunatics. They look to them consequently for confirmation and approval of their acts, because they are their superior officers when dealing with State, asylums. Hence overseers of the poor often delay performing a duty to the insane, whose complete execution is divided between them and the superintendents, while awaiting the action of

the latter. It is the duty of the county superintendents, being also ministerial officers in relation to the pauper insane, to see that, when the initiative devolves upon them, they are not guilty of any delay in executing their part of this divided trust. And, in turn, they should instruct overseers of the poor and keepers of alms-houses in relation to their duties toward and the scope of their powers over the insane. It is never safe to assume that such things are known by subordinates. The only true way is to establish a uniform system of by-laws for every alms house, and compel all within it to obey them strictly.

COMMITMENT PAPERS.

It is the duty of all persons committing lunatics to any asylum to send with them the necessary papers legalizing such commitment. It is often the case, however, that medical certificates are presented, without having annexed to them the approval of a Court of Record. In this way the party committing the lunatic throws the responsibility upon the superintendent of the asylum, either of dismissing and setting at large a dangerous lunatic after five days' detention, or else of *illegally* retaining an insane person. This is a wrong done to the superintendent, which justifies him, in self-defense, in sending back, at the expense of the counties, all persons thus illegally thrown upon his hands. It is not a matter of choice with him, but of duty, to discharge all persons remaining illegally in his custody. (Tit. I, Art. 1, §1.)

The duty of county superintendents in all cases of commitment of lunatics may therefore be summed up as follows, viz :

First—Not to retain any case of insanity of less than a year's duration in any county asylum or poor-house (except in counties having legislative permission) for more than *ten* days.

Second—To obtain proper medical certificates of a date not exceeding ten days previous to commitment.

Third—To perfect the legality of commitments, by having the medical certificates approved by some Court of Record, before sending the lunatic to an asylum.

Fourth—To leave with the superintendent of the asylum the medical certificates, or certified copies thereof, as part of the commitment papers.

RECORDS AND STATISTICS.

It is the duty of superintendents of the poor to keep a record book in their county asylums, giving a statistical history of the insane committed to their care, and to furnish a synopsis of the same annually to the State Commissioner in Lunacy, through the keeper of their asylum. (Tit. I., Art. 1, § 4; and Tit. I., Art. 10, § 5.)

The Commissioner regrets to say that this latter provision has not been complied with to the extent nor with the punctuality demanded by the terms of the statute. As it is made his duty to present these statistics to the Legislature annually, and he can only obtain them through the superintendents, they are respectfully reminded that by Section 6 of Tit. X. it is made a misdemeanor, punishable by fine, to neglect to furnish these statistics in the *manner* and within the *time* (1st to 15th November) required by the statute.

TRANSFERS.

The transfer of patients of the chronic class from the other State asylums to the Willard Asylum is provided for in Tit. IV., § 10, and fresh medical certificates are not required in these cases. The order of the superintendent of the poor providing for the support of the patient is all that is necessary. In all other cases sent to the Willard Asylum medical certificates must accompany the order.

JOHN ORDRONAU,

State Commissioner in Lunacy.

(I.).

AUTHORITIES CONSULTED.

The following are the titles of a few books and pamphlets which have been consulted in preparing this hand-book. They are all simple and readable treatises, and visitors would do well to look them up in some public library. Hints on nursing and on apparatus were also furnished by the Secretary of the Connecticut Training-School Board.

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